DEC 4 1919

SERIES 3—Vol. 2, No. 11 NOVEMBER, 1919

AMERICAN JOURNAL OF OPHTHALMOLOGY

Incorporating Established by

THE AMERICAN JOURNAL OF OPHTHALMOLOGY.....Adolf Alt 1884
THE OPHTHALMIC RECORD.....Giles C. Savage 1891
ANNALS of OPHTHALMOLOGY.....James Pleasant Parker 1892
ANALES DE OFTALMOLOGIA.....M. Uribe-Troncoso 1898
OPHTHALMOLOGY.....Harry V. Würdemann 1904
OPHTHALMIC YEAR BOOK AND LITERATURE..Edward Jackson 1904-11

EDITORS

EDWARD JACKSON CASEY A. WOOD

EDITORIAL STAFF

ADOLF ALT M. URIBE-TRONCOSO
MEYER WIENER HARRY V. WÜRDEMANN
CLARENCE LOEB, *Associate Editor.*

COLLABORATORS

FRANK ALLPORT, *Chicago;* HUGO W. AUFMWASSER, *Denver;* HANS BARKAN, *San Francisco;* ARTHUR J. BEDELL, *Albany;* EDMOND E. BLAAUW, *Buffalo;* MELVILLE BLACK, *Denver;* NELSON M. BLACK, *Milwaukee;* FRANK E. BRAWLEY, *Chicago;* WM. E. BRUNER, *Cleveland;* BURTON CHANCE, *Philadelphia;* WM. H. CRISP, *Denver;* GEORGE S. DERBY, *Boston;* EDWARD C. ELLETT, *Memphis;* MARCUS FEINGOLD, *New Orleans;* WM. C. FINNOFF, *Denver;* M. W. FREDERICK, *San Francisco;* HAROLD GIFFORD, *Omaha;* HARRY S. GRADLE, *Chicago;* D. F. HARBRIDGE, *Phoenix, Ariz.;* WM. F. HARDY, *St. Louis;* EMORY HILL, *Chicago;* GUSTAVUS I. HOGUE, *Milwaukee;* THOMAS B. HOLLOWAY, *Philadelphia;* JOHN A. MCCAW, *Denver;* CHARLES H. MAY, *New York;* WALTER R. PARKER, *Detroit;* SAMUEL D. RISLEY, *Philadelphia;* GILES C. SAVAGE, *Nashville;* E. MAYO SCHNEIDEMANN, *Philadelphia;* THEODORE B. SCHNEIDEMAN, *Philadelphia;* GEORGE E. DE SCHWEINITZ, *Philadelphia;* T. H. SHASTID, *Superior, Wis.;* CHARLES P. SMALL, *Chicago;* GEORGE W. SWIFT, *Seattle;* WILL WALTER, *Chicago;* JOHN E. WEEKS, *New York;* WM. ZENTMAYER, *Philadelphia;* CHARLES ZIMMERMANN, *Milwaukee. Foreign:* A. A. BRADBURNE, *Manchester, England;* MARCEL DANIS, *Brussels, Belgium;* ENRIQUE B. DEMARIA, *Buenos Aires, Argentina;* HENRY ROBERT ELLIOT, *London, England;* J. SANTOS FERNANDEZ and F. M. FERNANDEZ, *Havana, Cuba;* J. DE J. GOZALES, *Leon, Mexico;* M. LANDOLT, *Paris, France;* J. KOMOTO, *Tokyo, Japan;* ARTHUR F. MACCALLEN, *Cairo, Egypt;* F. P. MAYNARD, *Calcutta, India;* E. E. MONTAÑO, *Mexico City;* SPECIALE CIRINCIONE, *Rome, Italy;* FREDERICK C. TOOKE, *Montreal, Canada.*

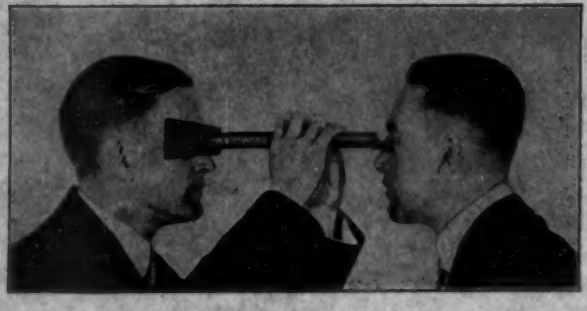
Annual Subscription Ten Dollars in Advance,
Single Copies One Dollar.

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY,

7 West Madison Street, Chicago, Illinois.

Entered as Second Class Matter January 1st, 1918, at the Post Office, Chicago, Ill., under the act of March 3rd, 1879.

Bausch & Lomb
Interpupillary Distance Gauge



THIS is one of our well-known line of ophthalmic instruments designed to further the advance of modern refraction methods. It affords a reliable, convenient and time-saving device for measuring the exact distance between the pupils, and should be in the equipment of every ophthalmologist who seeks the utmost precision in his work. Its peculiar advantage is that it measures the distance of EACH PUPIL from the center of the bridge of the nose—a most important measurement for the accurate adjustment of any frame.

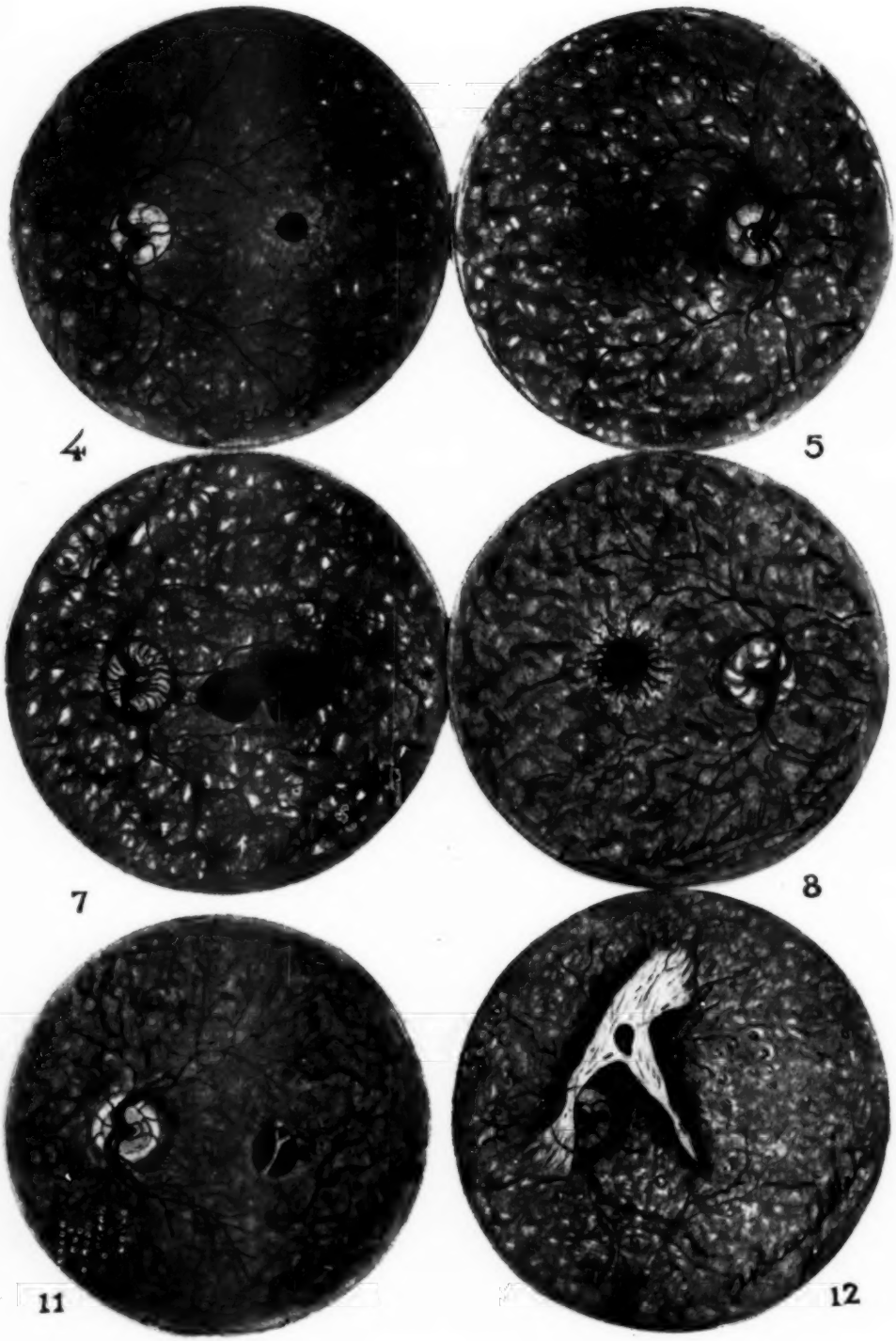
We have been unable to fill orders for this, or any of our ophthalmic instruments, for some time past because of the important war work in which we have been engaged. Our facilities are now being gradually released from the national service, and as we return to a peace production basis we expect to serve our patrons in this important line even more efficiently than before.

Bausch & Lomb Optical Co.

320 St. Paul Street Rochester, N. Y.

NEW YORK WASHINGTON CHICAGO SAN FRANCISCO

Manufacturers of Ophthalmic Lenses and Instruments, Microscopes, Projection Apparatus (Balopticons), Photographic Lenses, Range Finders and Gun Sights for Army and Navy, Searchlight Reflectors, Binoculars and Other High-Grade Optical Products.



MACULAR HOLE IN THE RETINA.

THE NUMBERS INDICATE THE CASES REPRESENTED

AMERICAN JOURNAL OF OPHTHALMOLOGY

Vol. 2 NOVEMBER, 1919 No. 11

MACULAR HOLE IN THE RETINA

A. B. MIDDLETON, MAJOR M. R. C., U. S. ARMY

PONTIAC, ILLINOIS.

This paper reports 23 cases of so-called hole in the macula discovered in the examination of recruits, many of whom were suspected of malingering. These reports furnish the basis for a statistical study and indicate the frequency of a lesion heretofore supposed to be rare. Authority to publish granted by the Board of Publication, S. G. O.

Among the eye cases referred to the Special Medical Examining Board, U. S. Army, Camp Travis, Texas, during 1917 and 1918, out of 100,000 troops, twenty-three men had a hole in the retina at the macular region. Most of these men were inducted into the service as malingerers or fakers, endeavoring to avoid the draft, if possible, by claiming a dimness of vision in one eye.

The members of the local board, on inspection of the eyes, in cases of this kind find nothing abnormal, except a slightly dilated pupil. It often happens that some member of the board has known the applicant for years without being aware of the fact that the man has one defective eye; therefore the members of the board are perfectly honest in their opinion, and absolutely correct in their action when they induct such a man into the army. Many drafted men claim a dimness of vision in a normal eye to avoid the draft. All local boards have had this trick played upon them, and are to be complimented on not having taken any chances during the last few increments.

A retinal hole at the macular region is seldom seen in the practice of our busiest oculists, and is not frequent in our largest eye clinics. There are many suffering with a retinal hole at the macula, who do not know what is wrong with their weak eye, due to the fact that they have not had it examined by a doctor.

A hole in the retina, when located in the macular region, is a perfect circle as a rule, but is occasionally elliptical.

STATISTICS

Elliptical holes	4
Round holes	19
Light pink choroid	9
Dark pink choroid	14
Pigmented halo around hole	14
White exudate specks	13
White exudate specks, pigmented.	8
White exudate specks, retina	10
Scotoma central	17
Scotoma of half of field	3
Pigmented choroid	12
Rupture choroid	7
Right eye	14
Left eye	9
Colored	13
White	10
Specific history	6
Scintillans	2
Detached retina	1
Dilated pupil	23
Light reaction retarded	23
Accommodation reaction retarded	23
Power of convergence reduced	23
Squint	1

In this series of cases are nineteen round retinal holes and four elliptical. The elliptical cases have a large retinal hole, the long axis of which is horizontal, as a rule, and if extended would strike the disc.

The small holes are perfectly round, due to the fact that they are contained within that portion of the retina, at the macular region, which is reduced in thickness. The retina increases in thickness from the fovea outward in all directions, offering an equal resistance

to a retinal tear, confining it to this particular area; thus the circular retinal hole.

If the accident is great enough to produce a retinal tear that extends thru the thick retina at the macular area, the retinal hole usually becomes elliptical in shape, following the line of least resistance, which, as a rule, is horizontal. This does not hold true in all cases, however, there being two in this series with large round retinal holes, but it holds true in all the elliptical cases. The fact that an occasional hole in the macular region is large and round may be due to a congenitally large area of thin retina at the macular region.

The color of the exposed choroid in the bottom of a retinal hole, at the macula, varies between a light and dark mottled cherry red, and has no diagnostic value. The cases being equally divided between light and dark. The light choroids are as frequent in the white as the negro, which proves the degree of pigment in the body has nothing to do with the amount of pigment in the choroid, when exposed at the macula thru a hole in the retina.

As a rule, there is a halo of pigment in the retinal hole that varies in density. In some cases the pigment deposit is nothing more than a thin sheen, while in others it is in radiating, crooked streaks, or densely deposited patches. Four cases of this series are entirely free from a deposit of pigment, giving a picture of an arterial retinal embolism, with the exception of many small white exudative specks, seem on the surface of the exposed choroid and the retina around the hole.

The small white exudative specks seen in the most of these cases, are nothing more than the remnants of a hemorrhage that took place, in the retina, at the time of the injury. Exudative white specks are free from pigmented margins in some of the cases. This is due to the fact that in certain cases the injury did not disturb the pigment layer, consequently the deposits are free from pigmented margins. In those cases where the pigmented layer is disturbed by the injury the exudative white specks have pigmented margins, giving them the appearance of a disseminated choroiditis.

A central scotoma is present in each uncomplicated case, the size of the scotoma and the retinal hole bearing some relation to each other, the largest retinal hole showing the largest central scotoma. Four of these cases are complicated with a rupture of the choroid on the temporal side of the macular retinal hole; the field of vision in each of these cases shows the nasal half dark. The right eye was injured in fourteen cases and the left in nine; while this number is not evenly divided, it is too small to make conclusions.

There is a much higher percentage of retinal holes at the macular region among the colored than the white. In this list of cases are thirteen colored and ten white. The fact that we had five times as many whites as colored, from whom these cases were referred, must not be forgotten, proving the percentage of colored would be much higher, if the troops were equally divided. The higher percentage of retinal holes at the macular region among the colored over the whites, does not necessarily mean that the colored have a weaker retina at the macular region than the whites. True the most of them have syphilis, more than one half the cases in this list admitting a positive specific history, yet there are several things we must consider, before we come to a positive conclusion.

The colored people are careless and take more risks with their eyes than the whites; fist fighting, the throwing of stones, sticks, etc. Most colored soldiers were inducted into the service regardless of their vision; while on the other hand, we are safe in saying that a certain percentage of whites, with a retinal hole, were rejected by their local boards on the strength of reduced vision, or intraocular examination, which reduced the percentage of whites.

Taking into consideration all the facts in these cases, the writer is of the opinion there is very little, if any, difference between the white and the

black race with regard to the percentage of retinal holes in the macular region, provided they were both given the same environment.

Every case in this list has a slightly dilated pupil, reacting slowly to light and accommodation, as well as a retarded power of convergence, which means nothing more than would be expected in any eye condition, with a dimness of vision, due to a central scotoma. The macular area of the retina being absent, prevents the transmission of enough light, centrally, to produce sufficient sympathetic action in the affected eye, to give it an equal pupil. The slow reaction to accommodation, is the result of the reduced central vision, which is also responsible for the slow power of convergence.

It is a remarkable fact that an injury great enough to cause a retinal hole in the macular region, seldom, if ever, causes a fluidity of the vitreous, dislocated lens, traumatic cataract, detached retina, or optic atrophy.

Cases

Case 1. Private W. J. M. (Col.), Res. Pan Handle, Texas. Ex. Sept. 1, 1918.

History. Was kicked over the left eye by a mule, twelve years ago; prior to the injury could see as well with one eye as the other; both eyes swelled shut following the accident, and could not open the eyelids for one week. The vision in the left eye slowly returned during the first month to its present strength, and has not given pain or trouble except the dullness of vision. Specific history.

Examination. Age 21 years; farmer; single. Vision R. 20/20; L. 20/200. Tension normal; left cornea clear and free from scars; aqueous clear, iris free from adhesions and pigment deposits. Pupil slightly dilated, reacting sluggishly to light and accommodation, power of convergence reduced. Lens normal, vitreous clear and not fluid. At the macular region there is a slightly depressed elliptical area, the long axis of which is equal in length to the diameter of the disc. The position of the ellipse is such, if the axis was extended, it would strike the center of the disc. The exposed choroid at the bottom of the retinal hole, is a light red raspberry color. The margin of the retinal hole has a sharply cut edge, which is free from pigment. On the surface of the exposed choroid are many small white exudative specks, one millimeter each in diameter, free from pigmented margins, giving the surface a mottled appearance. Around the retinal hole is a thin halo of pigment, one fourth the disc diameter in width. On the pigmented retina are several exudative white specks, two millimeters each in diameter, with distinct pigmented margins. The vessels and disc are normal in color and shape. The choroid is free from rupture and choroiditis. Large central scotoma.

Case 2. Private W. B. (Col.) Age 28 years; farmer; single. Res. Grand View, Texas. Ex. July 18, 1919.

History. When sixteen years of age, was hit in the left eye with a stone, could see nothing but the light for months. Later the vision slowly returned to its present strength. Before the accident one eye was as good as the other, never consulted a doctor with regard to the eye, which has not given one moment's pain or trouble since the injury.

Examination. Vision R. 20/20; L. 10/200. The left cornea is clear and free from scars; aqueous humor clear. Iris free from adhesions and pigment deposits, pupil semidilated reacting slightly to light and accommodation. Power of convergence reduced, lens normal, vitreous clear and not fluid. At the macular region there is a slightly depressed circular area, with a diameter equal to one-third the diameter of the disc. The exposed area of the choroid at the bottom of the retinal hole is a dark cherry red color. The distinct sharply cut retinal margin is a darker red. The exposed surface of the choroid at the bottom of the retinal hole, has six or eight white exudative dots, one millimeter each in diameter, giving this surface a mottled appearance; between these dots is a slight deposit of pigment. A pigmented area extends over the retina a distance equal to the diameter of the disc, with the retinal hole in its center. Over the pigmented area of the retina, are twenty or thirty white exudative specks, one millimeter each in diameter. The margins of

these specks are pigmented, very dark, giving the appearance of a choroiditis. In the non-fluid vitreous, between the disc and the retinal hole, are many cholesterin crystals. The vessels are normal. The disc is normal in shape and color. No signs of choroidal rupture or choroiditis. Large central scotoma.

CASE 3. Private J. L. H. (Col.) Age 27; farmer; married. Res. Gillsborough, Texas. Ex. July 18, 1918.

History. Hit in the right eye with a baseball nine years ago; prior to injury the vision was as good in one eye as the other, at that time the eye swelled and was very painful, but has not given the slightest trouble since; the vision slowly returned to its present strength. Has not had eye examined by a doctor.

Examination. Vision R. 10/200; L. 20/20. The cornea of the right eye is clear and free from adhesions and pigment deposits. Pupil semidilated reacting slowly to light; accommodation and convergence. Vitreous clear and not fluid. At the macular region there is a slightly depressed circular area of a dark cherry red color, the diameter equaling one-third the diameter of the disc. The distinct sharply cut retinal margin around the retinal hole is not of a darker color. There are no white specks on the surface of the exposed choroid, but there are a number of pigmented areas one half millimeter each in diameter, that give a mottled appearance to the bottom of the retinal hole. A halo of clear retina, two millimeters in width, surrounds the retinal hole, beyond this clear area is a pigmented halo one-half the disc diameter in width. In this pigmented area are many white exudative specks, two and three millimeters each in diameter, the margins of which are very black, giving the appearance of small patches of choroiditis, but are plainly seen resting on the retina. The vessels are normal, disc normal in shape and color; no signs of a rupture in the choroid, or choroiditis. Large central scotoma.

CASE 4. Private M. K., Q. M. C., Camp Travis, Texas; age 29 years; smelter; married; Res. Pittsburg, Kans. Ex. October 4, 1918.

History. Was hit in the right eye with a ball fifteen years ago while playing at school; the eye became painful and was badly swollen for one week. Prior to the accident one eye was as good as the other, but since the injury the sight has remained at its present strength, and the eye gives no trouble other than dimness of vision.

Examination. Vision R. 20/20; L. 20/200. The examination of the left eye shows the cornea clear and free from scars, aqueous humor clear, iris free from adhesions and pigment deposit. Pupil slightly dilated, reacting to light and accommodation slowly. Power of convergence reduced, lens normal. Vitreous clear and not fluid. At the macular region there is a slightly depressed circular area, with a diameter equal to one-third the diameter of the disk; the bottom of the depression is covered with exposed choroid of a light cherry color. The margin of the retinal hole has a sharply cut edge which is not pigmented. There is an absence of pigment on the surface of the exposed choroid, the mottled appearance being due to a number of white exudative specks one millimeter each in diameter. The retina around the retinal hole is entirely free from pigment deposit, but there are a number of white exudative specks two millimeters each in diameter, forming a ring around the retinal hole about three millimeters from the retinal margin. The vessels normal, disc normal in color and shape. No rupture of the choroid or choroiditis. Large central scotoma. See Plate XVIII, No. 4.

CASE 5. Private I. S. (Col.) Age 25 years; farmer; single; specific history; residence Quanah, Texas. Ex. August 22, 1918.

History. Was hit in the right eye with a clod ten years ago, could see as well out of one eye as the other before the injury; for several days following the accident, the eye was badly swollen and the lids could not be opened. For one month had only light perception, but later vision returned to present strength. The eye has not given any trouble other than a dimness of vision, and had not been examined by a doctor prior to entering the army.

Examination. Vision R. 20/200; L. 20/20. Examination of the right eye

shows the cornea clear and free from scars, aqueous clear, iris free from adhesions and pigment deposits. Pupils slightly dilated reacting slowly to light and accommodation. Power of convergence retarded, lens clear and normal. Vitreous clear and not fluid. At the macular region there is a slightly depressed elliptical shaped area, the long axis of which is equal in length to three-fourths the diameter of the disc; this axis if extended toward the nose would strike the upper margin of the disc, the width is equal to one-half the diameter of the disc. The exposed choroid in the bottom of the depression is of a light cherry red color. The margin of the retinal hole is a dark red color. The surface of the exposed choroid is free from pigment but is covered with many white exudative specks, one-half millimeter each in diameter, giving a mottled appearance. Radiating in all directions from the margin of the retinal hole for a distance equal to two-thirds the diameter of the disc is a stellate formation of pigment deposit on the retina, the pigment collected in crooked lines, resembling the legs of a bug. The vessels normal, disc normal in shape and color. No rupture of the choroid or choroiditis. An absence of white exudative specks outside of the retinal hole. Large central scotoma. See Plate XVIII, No. 5.

CASE 6. Private C. T. (Col.) Age 22 years; farmer; single; specific history; Res. Taylor, Tex. Ex. July 16, 1918.

History. Was hit in the right eye with a baseball four years ago, prior to the accident one eye was as good as the other; following the injury the right eye was very painful for one week with only light perception; later the vision gradually returned to its present strength; and the eye has given no pain or discomfort other than the dimness of vision. The eye had not been examined by a doctor before entering the army.

Examination. Vision R. 10/200; L. 20/20. Examination of the right eye shows the cornea clear and free from scars, aqueous clear, iris free from adhesions and pigment deposits. Pupil slightly dilated, reacting to light and accommodation. Power of convergence retarded. Lens normal. Vitreous clear and not fluid. At the macular region there is a slightly depressed circular area, with a diameter equal to one-half the diameter of the disc; the exposed choroid at the bottom of the retinal hole is a dark cherry red color. The margin of the retinal hole has a sharply cut edge, which is slightly pigmented. A slightly pigmented area, the diameter equaling the whole area, is sprinkled with exudative white specks, one and two millimeters each in diameter. These white exudative specks have distinctly pigmented margins resembling small patches of choroiditis. The disc is normal in shape and color. Vessels normal. No rupture of the choroid or choroiditis. Large central scotoma.

CASE 7. Private A. M. (Col.) Age 32 years; cook; married; Res. Houston, Texas. Ex. Aug. 29, 1918.

History. Hit in the left eye with a stick ten years ago; prior to this injury the vision was as good in one eye as in the other. The eye was painful and swollen for weeks following, but later the vision slowly returned to its present strength; tried to get glasses several times but never had the eye examined by a doctor. Four weeks ago was hit in the same eye with a bottle, after which could not see anything but the light until a few days ago. Specific history.

Examination. R. 20/20; L. 10/200. The left eye shows the cornea clear and free from scars; aqueous humor clear, iris free from adhesions and pigment deposits that might suggest an old iritis. Pupil dilated, reacting slowly to light. External squint, absence of power of convergence and accommodation. At the macular region there is a slightly depressed circular area with a diameter equaling one-fourth the diameter of the disc. The bottom of the depression is covered with exposed choroid, the surface of which is sprinkled with many small pigment spots, giving a mottled appearance. Around the retinal hole on the retinal surface is a halo of densely deposited pigment. In the densely pigmented area are several small specks of white exudate, one millimeter each in diameter, but there is an absence of these specks on the surface of the exposed choroid at the bottom of the retinal hole. Between the retinal hole

and the disc is a light pinkish colored subhyaloid hemorrhage, about the size of the disc, resembling a duck turned wrong side up, with its neck extending directly below the center of the retinal hole. Between the subhyaloid hemorrhage and the disc is a fresh retinal hemorrhage four millimeters in diameter. The fresh and the subhyaloid hemorrhages are the results of the last injury, while the retinal hole is the result of the first accident. No rupture of the choroid or choroiditis. Disc normal in shape and color. Large central scotoma. Tension normal See Plate XVIII, No. 7.

Case 8. Private I. C. (Col.) Age 27 years; round house laborer; married; specific history. Ex. July 17, 1918.

History. Hit in the right eye with a stone seven years ago, prior to the injury could see as well out of one eye as the other; following the accident the eye was badly swollen and painful for several days; the vision gradually returning to its present strength. The right eye has not given one moment's trouble other than dimness of vision.

Examination. Vision R. 10/200; L. 20/20. The right cornea is clear and free from scars; aqueous humor clear, iris free from adhesions and pigment deposits. Pupil slightly dilated, reacting to light and accommodation slowly. Power of convergence reduced, lens normal, vitreous clear and not fluid. At the macular region there is a slightly depressed circular area, with a diameter equal to three-fourths the diameter of the disc. The exposed choroid at the bottom of the depression is a dark cherry color. The distinct sharply cut retinal margin is much darker, due to a deposit of pigment, around the edge of the retinal hole. On the exposed choroid are a number of pigmented specks, two millimeters each in diameter, giving the surface a mottled appearance, resembling a ripe red raspberry. A halo, one-half the disc diameter in width, surrounds the retinal hole, made up of pigment deposits in streaks radiating from the outer margin of the retinal hole like the petals of a sunflower. Among the crooked pigmented streaks are many white exudative specks, one-half to two millimeters each in diameter. There is an absence of white exudative specks on the surface of the exposed choroid. Vessels normal. Choroid not ruptured and free from choroiditis. Large central scotoma. Tension normal. See Plate XVIII, No. 8.

Case 9. Private F. L. W., Co. F., 35th Infantry, age 24 years; farmer; single. Res. Springfield, Col. Ex. Nov. 18, 1918.

History. Hit in the right eye with a baseball fourteen years ago. Following the injury the eye was painful and badly swollen for two weeks. Prior to the injury the vision was as good in one eye as in the other. The eye has not given one moment's trouble, other than the reduction of vision. The sight in the right eye gradually returned to its present strength soon after the removal of the bandages following the accident.

Examination. Vision R. 20/200; L. 20/20. The right cornea is clear and free from scars; aqueous is clear; iris free from adhesions and pigment deposits; pupil semidilated, and reacts slowly to light and accommodation. Power of convergence reduced. Lens normal. Vitreous clear and not fluid. At the macular region there is a slightly depressed elliptical area, the long axis of which is equal to one-half the diameter of the disc. This axis if continued would pass up and in to a point one disc diameter above the disc. The transverse diameter is equal to one-third the disc diameter. The exposed choroid at the bottom of the depression, is a dark cherry red color. On its surface are five pigmented specks, one millimeter each in diameter and seven white exudative specks of the same size, free from pigmented margins. The margin of the retinal hole has a sharply cut edge with a darker color than the exposed choroid. Around the elliptical retinal hole is a halo three millimeters in width, of a light gray color, due to a detached retina, the outer margin of which is a trifle darker. Beyond the outer margin of the detached retina on the surface of the attached retina, completely surrounded by a halo, are some fifty small white exudative specks, two and three millimeters each in diameter, free from pigmented margins. In the vitreous, are five bright stationary scintillans, equally distributed.

Disc normal in shape and color. Choroid free from rupture and choroiditis. Vessels normal. Large central scotoma.

CASE 10. Private H. I. H. Age 22 years; farmer; single. Res. Brice, Texas. Ex. Nov. 9, 1918.

History. Hit in the right eye with a piece of wire when seven years of age; does not remember the accident but has been told one eye was as good as the other before the accident. Has not had one moment's pain or trouble with the eye other than reduced vision.

Examination. Vision R. 20/200; L. 20/20. Tension of the right eye normal; cornea clear and free from deposit. Pupil slightly dilated, reacting slowly to light and accommodation. Power of convergence reduced. Lens normal. Vitreous clear and not fluid. At the macular region there is a slightly depressed circular area the diameter of which is equal to one-third the diameter of the disc. The exposed choroid in the retinal hole is a light pink color. The margin of the retinal hole is sharply cut and darker red. On the surface of the exposed choroid many small white exudative specks, one half millimeter each in diameter. Absence of pigment in the bottom of the retinal hole, but on the retina toward the disc side, of the retinal hole, is a mass of exudate, covered with densely deposited pigment, giving the appearance of an apple seed, extending slightly over the retinal hole, on the side toward the disc. Around the retinal hole, and the pigmented exudate is a light halo, giving the appearance of thin choroid two millimeters in width. Directly over this area are ten or twelve white exudative specks, one and two millimeters each in diameter, free from pigment deposits. Disc appears to be elliptical in shape but this is explained by the fact that there is corneal astigmatic error of three diopters. Vessels normal. Choroid free from rupture and choroiditis. The body is covered with a severe impetigo, that has been present since childhood. No specific history. Large central scotoma.

CASE 11. Private G. L. (Col.) Age 22 years; farmer; single. Res. Beaumont, Texas. Ex. May, 1918.

History. Specific history. Hit in left eye when a baby two and one-half years old, causing the reduction of vision. Gives a history of several hard blows to the left eye, but claims the vision was poor in the left eye before they were received. Very little confidence is placed in the story of the injury claimed to have happened when a mere baby.

Examination. Vision R. 20/15; L. 20/200. Tension normal. Left eye cornea clear and free from scars; aqueous humor clear, iris free from adhesions and deposit of pigment. Pupil slightly dilated, reacting to light and accommodation slowly. Power of convergence reduced. Lens normal; vitreous clear and not fluid. Below the macular region is a slightly depressed circular area, with a diameter equal to two-thirds the diameter of the disc. The exposed choroid at the bottom of the retinal hole is a dark cherry red color, with considerable deposit of pigment, giving the mottled appearance of a red raspberry. The margin of the retinal hole has a sharply cut edge, slightly darker than the exposed choroid. A rupture of the choroid extends across the bottom of the retinal hole. The rupture is vertical, extending to the retinal margins only, exposing a strip of sclera, forked at the upper one-fourth, one millimeter in width, and free from pigment deposit. This retinal hole is directly under the fovea centralis which is covered with a speck of white exudate two millimeters in diameter, free from pigment deposit. On both sides of the fovea centralis in the retina above the retinal hole, are remnants of a retinal hemorrhage of long standing, dark red in color. Vessels normal. Choroid free from ruptures outside of the retinal hole. No choroiditis. Large scotoma in the upper half of the field. See Plate XVIII, No. 11.

CASE 12. Private M. S. (Col.) Res. Pledger, Texas. Ex. July 17, 1918.

History. Age 24 years; farmer; married; specific history; left eye has been poor all his life; does not remember having had it injured. Sight slowly left the eye without pain or trouble of any kind several years ago.

Examination. Vision R. 20/20; L. 20/200. Tension normal. The left cornea is clear and free from scars; aqueous

clear; iris free from adhesions and pigment deposits. Pupil slightly dilated reacting slowly to light and accommodation. Power of convergence reduced. Lens normal. Vitreous clear and not fluid. At one-third the distance between the disc and the macular region, is a lightly depressed elliptical area, the long axis of which equals in length one-third the diameter of the disc, and if extended would pass up and in, at the angle of 10 o'clock. The transverse diameter equals one-fourth the disc diameter. The exposed cheroid in the bottom of the retinal hole is a dark cherry red. On the surface of the exposed choroid are seven white exudative specks, one-half millimeter each in diameter, free from pigment. The margin of the retinal hole has a sharply cut edge, slightly pigmented, giving the appearance of a distinct ring. The macular area is normal, free from exudate and choroiditis. A triangular mass of gray exudate extends into the vitreous from the surface of the retina in the upper nasal quadrant of the fundus. Each end of the exudate at the base of the triangle is attached to the retina along a distance equal to one diameter of the disc. One attachment below the nasal side of the disc, the other above, slightly to the temporal side. The position of the exudate causing the base of the triangle is equal in length to five disc diameters. The anterior point of the triangle is equal in length to five disc diameters. The anterior point of the triangle extends forward thru the vitreous a distance equal to the length of the base. The arm of the triangle extending forward is contracted, giving the appearance of an icicle. Near the center of the triangular exudate, extending forward is a circular hole, with a diameter equal to one-fourth the diameter of the disc. Thru the hole in the exudate can be seen the black pigment deposit on the surface of the retina, under and around the base of the triangular exudate. The exudate is in front of the retinal vessels, but there are several small vessels on the surface of the exudate. A disseminated choroiditis, with its bone corpuscle appearing as patches, extends over the whole fundus. No rupture of the choroid. Disc normal in size and color except one pigmented spot three millimeters in diameter on the temporal side of the disc extending to the edge of the physiologic cup. Field of vision shows the temporal half dark. See Plate XVIII, No. 12.

Case 13. Private A. M. (Col.) Res. Grapeland, Texas. Ex. Aug. 1918.

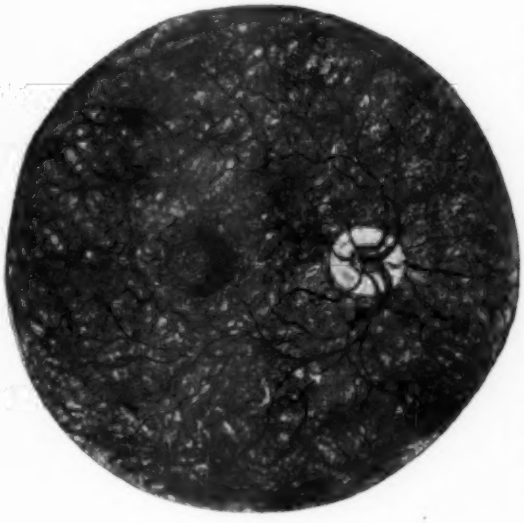
History. Age 24 years; married; farmer; specific history: two years ago hit in the right eye with a baseball; prior to the injury one eye was as good as the other. Following the accident the eye was painful and badly swollen for ten days; the sight gradually returning to its present strength; and has not given one moment's trouble, except the dimness of vision.

Examination. Vision R. 10/200; L. 20/20. Tension normal. The right cornea is clear and free from scars, aqueous clear, iris free from adhesions and pigment deposits. Pupil one-fourth dilated, reacting to light and accommodation slightly. Power of convergence greatly reduced. Lens normal. Vitreous clear and not fluid. At the macular region is a slightly depressed circular area, the diameter of which is equal to one-eighth the diameter of the disc. The exposed choroid at the bottom of the retinal hole is a light pink color, free from pigment and white exudative specks. To the temporal side of the retinal hole, on the surface of the retina, is a crescentic shaped exudate, deeply pigmented, three millimeters in width, that extends one-half around the retinal hole; in this same case is a crescentic shaped pigment deposit, of the same width, but free from exudate, giving a gray color. Around the macular hole, in the pigmented area is a distinct halo of white exudate and pigmented streaks, two-thirds the disc diameter in length, radiating from the margin of the deeply pigmented area at the macular region, resembling a daisy, or the picture that is often seen in cases of albuminuric retinitis. Vessels are normal. Choroid free from rupture and choroiditis. Tension normal. Field of vision shows a large central scotoma. Disc normal in shape and color.

Case 14. Private O. A. C. (Col.) Res. McLannon, Texas. Ex. Aug. 9, 1918.

History. Age 27, 1918; farmer; married. Hit in the right eye when a child, with a stone. Cannot tell when the accident occurred, but remembers the eye was painful and swollen for a number of days. Prior to the injury could see as well out of one eye as the other. Since then the eye has not given one moment's trouble except the dimness of vision.

Examination. Vision R. 10/200; L. 20/20. Tension normal. Right cornea clear and free from scars; aqueous clear, iris free from adhesions and pigment de-



Case 14.

posits. Pupil slightly dilated and responds to light and accommodation sluggishly. Power of convergence slow. Lens normal. Vitreous clear and not fluid. At the macular region there is a slightly depressed circular area, the diameter of which is equal to one-half the diameter of the disc. The exposed choroid at the bottom of the retinal hole is a light cherry red color. The surface of the choroid is free from pigment deposit, but is covered with small white exudative specks, one-half millimeter in width, extends one-half the circumference of the retinal hole on the nasal side; the temporal half of the circumference has a pigmented halo four millimeters in width, but much thinner. Absence of white exudative specks. Vessels are normal. Choroid free from rupture and choroiditis. Disc normal in shape and color. Large central scotoma.

Case 15. Private H. B. (Col.) Res. Nansota, Texas. Ex. Aug. 1, 1918.

History. Hit in the left eye with a bottle ten years ago; prior to the injury could see with one eye as well as the other; following the accident, eye was swollen and painful for two weeks. The vision returning to its present strength in a short time, and has not given one moment's trouble, except the dimness in vision. Did not have the eye examined by a doctor before entering the army.

Examination. Age 31 years; blacksmith; married; Vision R. 20/20; L. 10/200. Tension normal. Left cornea clear and free from scars. Aqueous clear; iris free from adhesions and pigment deposit. Pupil slightly dilated reacting slowly to light and accommodation. Power of convergence reduced. Lens normal; vitreous clear and not fluid. At the macular region is a slightly depressed circular area, the diameter equals one-third the diameter of the disc. The exposed choroid at the bottom of the retinal hole is of a dark cherry red color. On its surface are three white exudative specks one millimeter each in diameter, red from pigmente' margins. No pigment deposit on the surface of the exposed choroid. Retinal margin has a sharply cut pigmented edge, making a distinct ring. Rupture of the choroid, crescentic in shape, two and three millimeters in width, four disc diameters in length, exposing the sclera. A pigmented margin of retina, four millimeters in width, on both sides of the rupture, extends vertically on the temporal side of the retinal hole, the center of the ruptured choroid opposite and separated from the temporal side of the retinal hole by a narrow band of retina, two millimeters in width. The concavity of the rupture is toward the disc. The exposed sclera is of a light gray color, due to thin pigmented exudate. Vessels are normal, crossing the rupture in several places at right angles, nonparallel with choroidal rupture. No choroiditis. Disc normal in shape and color. The field of vision shows the nasal half dark.

Case 16. Private C. D. (Col.) Res. Belton, Texas. Ex. Aug. 23, 1918.

History. Age 25 years; farmer, married; specific history. Hit in the right eye with a baseball seven years ago, prior to the accident one eye was as good as the other; following the injury the eye was painful and swollen for several days, but did not have the eye examined by a doctor. In a few days following the disappearance of the swelling, the vision returned to its present strength. The eye has not given one moment's trouble except the dimness of vision.

Examination. Tension normal. Cornea clear and free from scars; aqueous clear; iris free from adhesions and pigment deposits. Pupil slightly dilated, reacting slowly to light and accommodation. Power of convergence reduced. Vitreous clear and not fluid. At the macular region is a circular area three millimeters in diameter, slightly depressed; the exposed choroid at the bottom of the retinal hole being a very light pink color. The exposed choroidal surface is free from white exudate specks and pigment. Rupture of the choroid, crescentic in shape, one millimeter in width, three disc diameters in length, on the temporal side of the retinal hole, extending vertically exposing the sclera. The concave side of the crescent is toward the disc. The center of the crescent is opposite the retinal hole, and separated from it by a band of retina one millimeter in width. The retina is deeply pigmented for a distance of three millimeters on both sides of the choroidal rupture. Absence of white exudative specks on the retina. Vessels normal. Many arterial and venous branches crossing the choroidal rupture at right angles; none parallel with the rupture. Disc normal in size, shape and color. Large central scotoma.

CASE 17. Private H. A. H. Ex. Aug. 5, 1918.

History. Age 22 years; married; no specific history; R. R. car man; hit in the right eye two years ago with a large piece of steel; following the accident the eye was very painful and swollen, requiring bandage for more than one week. Prior to the injury could see as well with one eye as the other. The vision slowly returned to its present strength and has not given one moment's trouble outside of the dimness of vision.

Examination. Vision R. 10/200; L. 20/20. Tension normal. Cornea clear but shows a faint central scar. Aqueous clear; iris free from adhesions and deposit of pigment. Pupil slightly dilated reacting slowly to light and accommodation. Power of convergence reduced. Vitreous clear and not fluid. At the macular region there is a slightly depressed circular area four millimeters in diameter. The exposed choroid at the bottom of the retinal hole is a light cherry color, free from white exudative specks and pigment deposits. The retina is pigmented slightly, a distance of one disc diameter in width completely around the retinal hole. This pigmented area is free from white exudative specks, but there is a very dense black deposit of pigment on three sides of the retinal hole, four millimeters in width on the upper, lower and nasal side. The densely pigmented retina on the nasal side of the retinal hole also extends toward the disc eight millimeters in length, giving the whole densely pigmented area the appearance of a lobster's claw, opened. Vessels normal. No choroiditis or rupture of the choroid. Disc normal in shape and color. Large central scotoma.

CASE 18. Private J. F. R. (Mex.) Stockdale, Texas. Ex. August 29, 1918.

History. Hit in the left eye with a stick one year ago. Prior to the accident could see as well with one eye as the other; following the injury, suffered with considerable pain. The eye was badly swollen for several days, but did not consult a doctor. Vision slowly returned to its present strength and the eye has not given one moment's pain or trouble except the dimness of vision.

Examination. Tension normal. Cornea of the left eye clear and free from scars; aqueous clear, iris free from adhesions and pigment deposit. Pupil slightly dilated, reacting slowly to light and accommodation. The power of convergence reduced. Vitreous clear and not fluid. At the macular region there is a slightly depressed circular area three millimeters in diameter. The exposed chor-

oid at the bottom of the retinal hole is of a dark cherry red color; on its surface are two small circular white exudative specks, one millimeter in diameter with pigmented margins. The margin of the retinal hole has a sharply cut edge, slightly pigmented, giving it the appearance of a narrow ring. Extending down and toward the disc from the lower edge of the retinal hole, is a rupture of the choroid twelve millimeters in length and two millimeters in width, exposing the sclera. The tear is at an angle, with the macula, equal to four on the clock dial. On each side of the rupture is a deposit of pigment in the retina, the pigmented area extending beyond the retinal hole. The rupture does not continue into the retinal hole, but to a point within three millimeters. Vessels normal, some of the smaller vessels crossing the rupture at right angles, but none directly over, or parallel to, the tear. Disc normal in size and color. Large central scotoma.

Case 19. Private M. B. (Col.) Co. 5, 165 D. B. Ex. April 2, 1918.

History. Was struck in the right eye with a stone when eight years old and has not seen well out of the eye since. Before the injury could see as well out of one eye as the other. The eye has not given one moment's trouble since, never pains or gets red and inflamed. Has not had the eye examined by a doctor before entering the army. No specific or tubercular history.

Examination. No squint. Tension normal. Right cornea clear and free from scars. Anterior chamber deep. Aqueous clear. Iris free from adhesion and pigment deposit. Pupil reacted slowly to light and accommodation. Power of convergence sluggish. Lens normal. Vitreous clear and not fluid. Disc normal in size and color. Vessels normal. No choroiditis or rupture of the choroid. At the macular region is a slightly depressed circular area. The diameter of the retinal hole is equal to one-third the diameter of the disc. The exposed choroid is a dark cherry red color covered with a fine sprinkling of pigment. The margin of the retinal hole is sharply cut and slightly increased in pigment, giving the appearance of a ring. Around the retinal hole is a halo of pigment and white exudate equal to one disc diameter in width. The pigment is deposited in streaks radiating from the margin of the hole, with white exudate between the streaks, giving the appearance of a daisy. Field of vision shows a large central scotoma. R. 1/200; L. 20/20.

Case 20. Private A. V. Co. 6, 165 D. B. Ex. April 4, 1918.

History. Was shot behind the right eye when fourteen years old, the bullet did not strike the front part of the eye but went in at the side. At the time of the injury the eye was very painful

Case 19.

and blind. The sight slowly returned to the present strength. The eye has not given one moment's trouble other than the reduced vision.

Examination. Vision R. 20/100; L. 20/20. No specific or tubercular history. Farmer; 22 years old. No squint. Tension normal. Cornea of right eye clear and free from scars. Anterior chamber deep; aqueous clear. Pupil dilated, reacting slowly to light and accommodation. Power of convergence reduced. Iris free from adhesions and pigment deposit. Lens normal. Vitreous clear and not fluid. Vessels normal. Disc normal in size and color. At the macular region is a slightly depressed circular area the diameter equaling one-fourth the

diameter of the disc. The retinal margin is sharply cut and slightly pigmented, making a slight ring. The exposed surface of the choroid is a dark cherry red color, sprinkled with pigment resembling emery dust. On the temporal side of the hole is a bifurcated choroidal tear exposing the sclera. The edges of the tear are pigmented and separated two to three millimeters. On each side of the tear are two circular spots of choroiditis three millimeters each in diameter exposing the sclera. The tear is in the position of eight o'clock from the retinal

Case 21.

hole, the bifurcation toward the upper end. The length of the tear is three disc diameters, the bifurcation beginning near the center. Several vessels pass across the floor exposed by the tear. No white exudative specks. Field shows nasal half dark.

CASE 21. Sgt. F. E. T., Co. C. 22, B. N. U. S. G. of Alston, Mass. Ex. Dec. 8, 1918.

History. Enlisted May 25, 1917, Ft. Slocum, N. Y. Single; waiter. Age 27 years. Hit with a stone May 28, 1918, while on rifle range at Sour Lake, Texas. Was in Camp Logan hospital 47 days. Prior to the accident one eye was as good as the other; following the injury the vision has continued to fail.

Examination. Vision R. 20/200; L. 20/20. No squint. Tension normal. Right cornea clear and free from scars. Anterior chamber deep, aqueous clear. Pupil dilated reacting to light and accommodation slowly. Power of convergence sluggish. Lens normal. Vitreous clear and not fluid. Vessels normal. Disc atrophic and elliptical, long axis vertical. The macular region shows a slightly depressed circular area, the diameter of which equals one-third the diameter of the disc. The exposed choroid at the bottom of the retinal hole is a dark cherry red color, the surface covered with a fine emery dust like pigment. The margin of the retina is sharply cut and slightly pigmented, giving a ring effect. Between the retinal hole and the disc is a large choroidal tear filled with an exudate. The tear is a semicircular affair the concavity of the tear toward the disc, the center of the tear passing near the disc margin of the retinal hole. The tear is six disc diameters in length, at the widest point one disc diameter in width. Near the center of the tear is a bifurcation down and in toward the disc beginning near the retinal hole extending to the vessels directly below the disc. Between the disc and the margin of the choroidal rupture, is a torn choroid in a worm-like shape one millimeter wide connecting the disc and the tear. A gray pigmented exudate fills the tear in the center but at each end is absent, several vessels passing over the sclera. Field of vision not taken.

CASE 22. Private N. W. (Col.) Co. 72, 165 D. B. Ex. May 9, 1918.

History. Hit in the left eye with a stone when fourteen years of age, the eye was badly swollen and bloodshot for two weeks following the accident. Prior to the injury one eye was as good as the other. The vision gradually returned to its present strength in the left eye, never giving the slightest trouble other than the reduction of vision. Never consulted a doctor or had the eye examined before entering the army.

Examination. No squint. Tension normal. Gives a specific history. Age 24 years. Single; farmer. Vision R. 20/70; L. 1/200. Left cornea clear and

free from scars. Anterior chamber deep. Aqueous clear. Pupil slightly dilated, reacting to light slowly. No reaction to accommodation. Power of convergence reduced. Iris free from adhesions and pigment deposit. Lens normal. Vitreous clear and not fluid. Vessels normal. Disc normal in size and color, the macular region shows a slightly depressed circular area the diameter equaling one-half the disc diameter in length. The margin of the retinal hole is sharply cut and deeply pigmented giving the retinal margin an appearance of a distinct black ring. The surface of the exposed choroid is a dark cherry red color; is covered with a sprinkling of pigment resembling emery dust. An absence of pigmented deposit in the retina around the retinal hole as well as an absence of white exudative deposit spots. Directly below the center of the retinal hole is a rupture in the choroid extending down and in turning toward the disc making a semicircle, striking the lower border of the disc directly in the center. This rupture of the choroid follows one of the main branches of the inferior retinal vein. The rupture is five millimeters wide, exposing sclera in the center of the rupture, parallel with the long axis is a retinal vein. The rupture is not continuous from the hole in the retina to the disc; one-half the distance between the disc and the hole is an isthmus of healthy retina and choroid four millimeters in width, this point corresponds with a bifurcation of the vein. Slight pigment deposit along the line of rupture in the retina and a slight deposit smeared over the exposed sclera. Field of vision not taken. No choroiditis.

CASE 23. Private G. S. (Col.) Co. 71, 165 D. B. Ex. May 9, 1918.

History. When a child six years old was hit in the left eye with a stone, the eye was swollen and painful for two weeks following the accident the vision gradually returning to its present strength. Prior to the injury could see as well with one eye as the other. Never had the eye examined by a doctor before entering the army, having no trouble other than the reduction in vision. No specific or tubercular history.

Examination. No squint; tension normal; vision R. 20/10; L. 10/200. Age 22 years; farmer; single. Left cornea clear and free from scars. Anterior chamber deep; aqueous clear. Pupil semidilated, reacting slowly to light and accommodation. Power of convergence reduced. Iris free from adhesions and pigment deposit. Lens normal. Vitreous clear and not fluid. Disc normal in size and color. Vessels normal. No rupture of the choroid or choroiditis. One-half the distance between the disc and the fovea centralis in the left eye is a slightly depressed circular area the diameter of which is equal to one-half the diameter of the disc. The exposed choroid at the bottom of the retinal hole is a dark cherry red color covered with a sprinkling of fine pigment resembling emery dust. The margin of the retina is sharply cut and deeply pigmented giving the appearance of a distinct ring, at the margin of the retinal hole. There is an absence of pigment deposit in the retina about the hole, also complete absence of white exudative specks.

HOLE AT THE MACULA

Ed. E. Maxey, Major M. C., U. S. Army

Boise, Idaho.

The series of cases here reported were observed at the Base Hospital, Camp Sherman, Ohio, during 1918, in the same service as a case previously reported in this Journal, February, 1918, p. 81. Authority to publish granted by the Board of Publication, S. G. O.

An interesting series of cases of hole at the macula have been observed from among the recruit soldiers at Camp Sherman, all in young colored men, and all giving a history of an injury to the affected eye. The accompanying figures well represent the fundus condition found in two of the cases.

Case 1. E. W., colored, private, age 22, was first seen as an out-patient, February 11, 1918, by Lieut. C. A. Burkholder, or about the time of publication of his first case. In this case there is a definite history of an injury to the right eye, evidenced by two small irregular scars on the right eyebrow. While splitting kindling some eight months before, a flying stick accidentally struck him over the right eye. The patient says that he was blind in the right eye for three months following the injury.

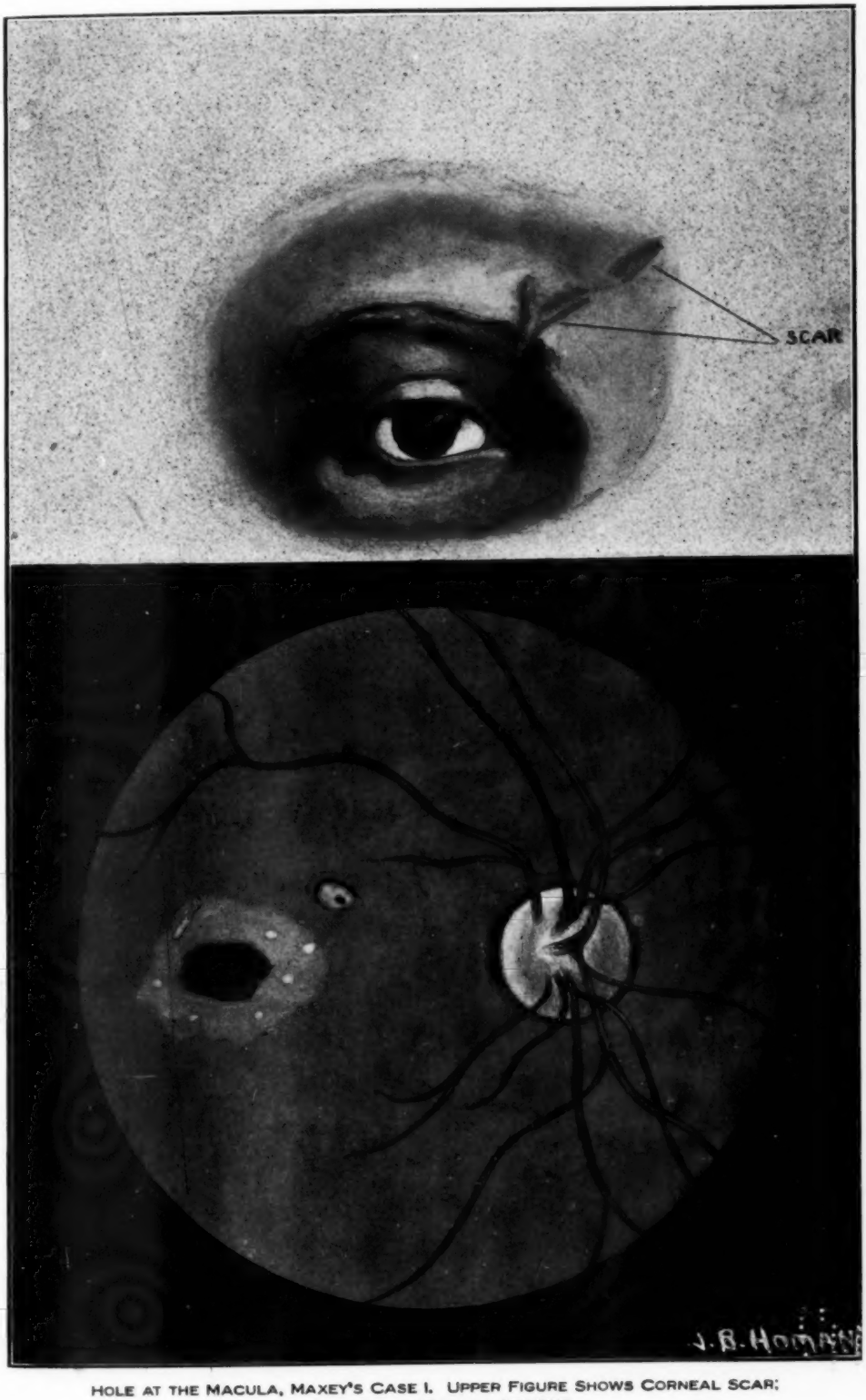
He comes to the clinic now complaining of poor vision, "slow" headache and pain in the left eye. Never glassed. Has had gonorrhea, but denies syphilis. Had typhoid fever when 15 years of age, and has had the usual diseases of childhood. Father and mother died eight years ago of consumption, and one sister died of tuberculosis 3 years ago. Has one brother and one sister living in good health. Patient is positive that before the injury to the right eye he could see equally well with either eye.

Examination. There are two small irregular scars on the right eyebrow and forehead, claimed to have been caused by the injury. See Plate XIX, upper figure. Right eye, external structures appear normal, cornea clear and smooth, anterior chamber apparently slightly deeper than the left, pupil reacts sluggishly to light, tension normal. The left eye is slightly more prominent that the right, conjunctiva slightly injected, with dusky-like induration in circumcorneal zone. Eyeball somewhat tender to palpation but tension is normal. Pupil reacts sluggishly to light. Vision: R. E. 20/200; L. E. 20/50, not improved by glassing. Wassermann blood test and urinalysis both negative. Blood count, reds 3,400,000, whites 5,100. Differential count, small mononuclear cells 20, large mononuclears 4, neutrophiles, 76.

Opthalmoscopic Examination. Right eye: Small pinhead sized opacity in the upper central portion of the lens, media clear. In the macular region is a "hole," of half a disc diameter, somewhat oval in shape, with clear margins. Base of the hole is dark red in color, slightly lower than the surrounding fundus, and has a somewhat granular appearance. Several crystals of cholesterin, and a few colloid bodies, were to be seen around the hole. Also a small colloid body at the nasal margin of the disc. Otherwise the fundus was normal. Left eye normal. See Plate XIX, lower figure.

Case 2. J. J. H., colored, age 22, private, Co. B. Dev. Bn. No. 5. Came to the out-patient clinic for glasses to improve a long existing blindness of the right eye. Refracted on Oct. 23, 1918. There is a history of injury to the right eye some years ago but the patient does not know whether his defective vision dates from that time or not. He has worn glasses for five years, has had them changed three times in that period, the last change being about six months ago. None of the glasses improved his vision. Denies history of syphilis, and family history is negative for tuberculosis and syphilis.

Examination. Eyes steady under cover, symmetric, lids normal and tension of both eyes is normal. The pupils are equal, 3 mm., round, and react normally to light, convergence and accommodation. Irides, anterior chambers, corneas, and conjunctivae normal. Vision R. E., light perception and projection, L.



HOLE AT THE MACULA, MAXEY'S CASE I. UPPER FIGURE SHOWS CORNEAL SCAR; LOWER FIGURE RETINAL LESIONS.

E., 20/25. Under cycloplegic, retinoscoped; R. + 1. Sph. ⌒ + 0.50 cyl. axis 90°; L. + 0.50 Sph. ⌒ +0.25 cyl., axis 120°; but no combination of lenses could be found that would make any improvement in the vision of either eye.

Ophthalmoscopic Examination. Right eye: Below and nasalward from the disc there is to be made out a limited area, two disc widths in diameter, a flat detachment of the retina, of pinkish color, which gave one the impression there was some underlying body. In the macular region there is a well-defined, roundish oval "hole," one-fourth disc in diameter, the base of which was of a granular appearance, dark red in color, and studded with cholesterin crystals. (We were unable to get a drawing of this fundus.) Left fundus entirely normal.

Case 3. E. B., colored, age 25, private, Co. D., 418 R. L. Bn., came to the eye service as an out-patient, Dec. 5, 1918, complaining of poor vision. Five years or more ago he was struck on the right eye by a baseball. There was at the time a lacerated wound just below the inferior orbital margin. Vision in the right eye he says has been poor ever since the injury, with no noticeable change in the vision. He is sure, however, that vision with the right eye was good before the injury. Patient contracted syphilis one year ago, and had gonorrhea shortly before that. No tubercular history in the family. Has had the usual diseases of childhood. Never glassed.

Examination. There is a horizontal linear scar 3 mm. long corresponding to inferior border of the right orbit. Eyes are steady under cover. Lids are normal except a very small chalazion in right upper. Tension of both eyes normal. Pupils are 2.5 mm. in diameter, round, equal, and react normally to light and accommodation. Conjunctiva of lids slightly congested and granular in appearance. Lacrimal sacs clean. General physical condition very good. Blood Wassermann one plus. Urine examination negative for albumin and sugar. The laboratory report on blood count did not give the number of red cells, but the whites were 10,500 and the differential count showed small m. 22, large m. 3, transitionals 2, eosinophiles 1, and neutrophiles 72.

Vision, R. E. 20/200; L. E. 20/20. Under cycloplegic the refractive error was found to be R. +0.50 ⌒ +0.50 cyl. axis 90°, vision not improved; and L. +0.50 sph., with no improvement.

Ophthalmoscopic Examination. Right eye media clear. In the macular region there is an oval, or pear shaped "hole" about one disc width in length, axis horizontal, and about one-half disc in width. The base of the hole is of a dark red color, granular in appearance, and studded with minute pigmentation and crystals of cholesterin. The hole is distinctly excavated, and the margins are clear cut and well defined. Entirely surrounding the hole is a band like area of grayish milky choroidal changes with a prolongation of this area from its inferior level to the disc. Seven or eight good sized crystals of cholesterin are distributed around the hole, in this area of choroiditis. Other portions of the right fundus appear to be normal. Left fundus normal.

DISTURBANCES OF VISION IN PATIENTS HARBORING FILARIAL TUMORS

R. Pacheco Luna, M. D.

GUATEMALA, C. A.

This paper, from the Department of Clinical Ophthalmology of the Medical School of Guatemala, describes a new form of corneal disease arising in patients suffering from certain filarial tumors.

In the February number, 1918, of this Journal we published a preliminary paper upon "Disturbances of Vision in Patients Harboring Certain Filarial Tumors." These disturbances we shall continue to consider as dependent on

the presence in the body of a parasite, the Onchocerca volvulus, Leuckart, 1893, until Professor Henry B. Ward of the University of Illinois classifies that Filariadae otherwise, at the conclusion of his investigations upon specimens which we sent him, and which we removed from patients coming under our observation.

We will now describe a clinical form of which, up to the present, we have made no mention, and which is quite prevalent. This form of the disease has the appearance of a microcornea, the diameters of the cornea seem actually less than the normal. But unlike microcornea of microphthalmia the eyeball retains its natural size. Therefore this form has characteristics peculiar to the complaint that we have referred to under the name of Onchocercosis in our first paper.

We presume the cause of the microcornea is some toxic process acting at a distance from the location of the parasite. This is the theory that also explains the other ocular symptoms of the Onchocercosis outside the eye. In the cellular tissue under the scalp, the part of the body for which the parasite apparently has marked predilection, the filaria secretes a substance having the property of altering the adjacent tissues which, thus transformed, constitute the tumors. The secretions absorbed and conveyed by the blood thruout the organism, produce ocular lesions, sometimes apparent and at others imperceptible to the usual methods of examination.

The patients in which the microcornea is the principal or sole symptom, do not suffer an appreciable loss of vision, nor do they experience any discomfort in the eye, which might cause them to consult a physician, as the progress of the disease is insidious and there is no acute process. The picture given is that of the microphthalmia, which is the only apparent symptom; the diameters of the cornea are diminished. the eyeball retaining its normal size. The average of the diameters thus affected, measure 8 to 9 mm. This contraction of the cornea is due to a process of Keratitia Marginalis Superficialis Punctata (Fig. 1.) quite different from the Keratitis Punctata Superficialis (Fig. 2.) that we described be-

Fig. 1. Keratitis Marginalis Superficialis Punctata. (Pacheco Luna.)

fore as a common occurrence in the Onchocercosis. In the new form which is the subject of this paper, the superficial punctate lesions are found at the limbus of the cornea; and there the grouping is so close that the uniform

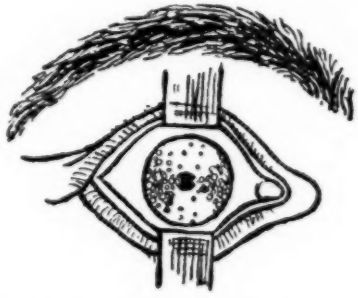


Fig. 2. Keratitis Superficialis Punctata. (Pacheco Luna.)

whitish opacity has the form of a ring of the same color as the sclerotic, and so similar that it appears to be one, there being no separating line between the two membranes. Such concentric disposition, which measures in some places as much as 2 mm., causes the reduction in the diameters of the cornea, and gives the eyeball the corresponding peculiar appearance.

The examination of the eye in the dark room by reflected light, without the use of magnifying instruments reveals the opacity as being superficial and situated immediately under the epithelium from which it does not protrude. As already mentioned the dotted elements are so uniformly and compactly grouped in the scleral border that they appear to be a continuation of the same, and form a thick and perfectly opaque membrane; but where this approaches the limit of the transparent cornea, the opacity becomes less thick, the elements less compact, they decrease in number, some become isolated. But so far we have not been able to observe elements in the central region of the cornea, and therefore the part normally traversed by the light rays is not interfered with, which explains the preservation of visual acuity.

The course of the microcornea is slow and progressive; but seems to have a limit, because as we have just observed the central portion of the cornea is not affected. Up to the present moment this condition may be considered as the mildest form of the Onchocercosis. In all the cases of microcornea that have come under our notice, the patients had filarial tumors. The progress of the lesions ceases when all the tumors (Figs. 5 and 6) are removed; but this is not always possible in practice because of their location.

The clinical diagnosis is greatly assisted by discovery of the tumors. They are generally encountered in the cellular tissue under the scalp. Figs. 3, 4 and 5 show tumors of different sizes, which are very similar in appearance, consistency, shape and size to the lipomatous tumors of the scalp, with which they were confused until lately. The smallest which can be observed are the size of a grain of rice, the largest, that of an almond, and when several are located together, the size of an orange. But they are generally met with of the size of a large bean (Vicia faba, L.); and are elliptical and somewhat gibbous, having two flat surfaces, obviously attributable to the compression exerted by distended tissues upon resisting surfaces. Occasionally they are found in the body, and if they are small it is practically impossible to locate them. If they are not pressed against a bone, they have a globular shape.

Figs. 3 and 4. Filarial tumors of scalp indicated by crosses (Pacheco Luna).

The blood examination does not seem to yield any important results; Dr. Robles endeavored to find the embryos in the blood, and repeated the test several times in the 24 hours; but the result was always negative. The

blood formula does not make the diagnosis more explicit, as all the patients are carriers of intestinal parasites.

Fig. 5. Filarial tumor of scalp indicated by cross. Extreme photophobia shown by contraction of brow and partial closure of lids. (Pacheca Luna.)

Fig. 6. The same patient as Fig. 5 after removal of tumor showing relief from photophobia.

This lesion, as well as the other ocular disturbances that we have described, yields to no other treatment than the removal of all the tumors. We have applied without result all the usual therapeutic agents, using the oral, subcutaneous, intravenous, conjunctival, subconjunctival methods of application, and also injections into the tumor itself. On the other hand the removal of the tumors gives immediate and surprising results, which are shown by comparison of Figs. 5 and 6. We affirm that no satisfactory results can be expected if tumors are left in the body.

THE SCOOP PERIMETER

S. J. Beach, M. D., F. A. C. S.

AUGUSTA, MAINE

This paper describes a new form of hand perimeter, a kind of curved campimeter, with explanation of manner of using it and charts for recording the observations made.

During the Selective Service examinations so many applicants were referred to our Medical Advisory Board for reports involving the visual fields, that it seemed imperative to devise some apparatus for this test more rapid than the regulation instruments. It was also essential to combine with speed the highest degree of completeness and accuracy.

While it often turned out that examination of the central field alone was ample, it seemed impossible to be sure of this until the peripheral field had been tested and found negative. When the examination involved only the central field, the handy little black board (hand campimeter) suggested by Dr. Peter, was, for a radius of forty degrees, both quick and accurate; but beyond this limit no short cut was available.

The importance of the outer field lies in its peculiar sensitiveness to various disorders. Its blood supply is relatively poor, and its visual elements easily disturbed. In the temporal extreme is often the first, and for a long time the only evidence of vascular trouble. In such cases its examination is of especial value.

The inaccuracy of the blackboard or tangent plane apparatus in the outer field is due in part to two causes. As the test object moves toward the edge of the board, its distance from the eye increases rapidly. It thus becomes relatively smaller. Hence the test is being conducted with an object of variable size. At the same time the projection of the outer field becomes correspondingly exaggerated, distorting the diagram.

Although these faults have been remedied by constructing instruments on the arc of a circle or the segment of a sphere, placing the eye at the center, it is at the expense of other essentials. The machines are slow, cumbersome and unevenly lighted. Many ingenious contrivances exist to meet these objections but are so intricate and easily got out of order that they are liabilities rather than assets.

Fig. 1. Scoop perimeter of Beach, showing method of using.

With the idea of providing a quick, comfortable and fool-proof apparatus, which would include the peripheral as well as the central field, a blackboard was bent on the segment of a concave cylinder, axis ninety degrees. This was satisfactory except that by it the inferior field was projected on a tangent, and extended nearly double the forty degrees of satisfactory tangential projection. Changing the lower half of the instrument to the segment of a sphere corrected this defect, producing the apparatus here shown.

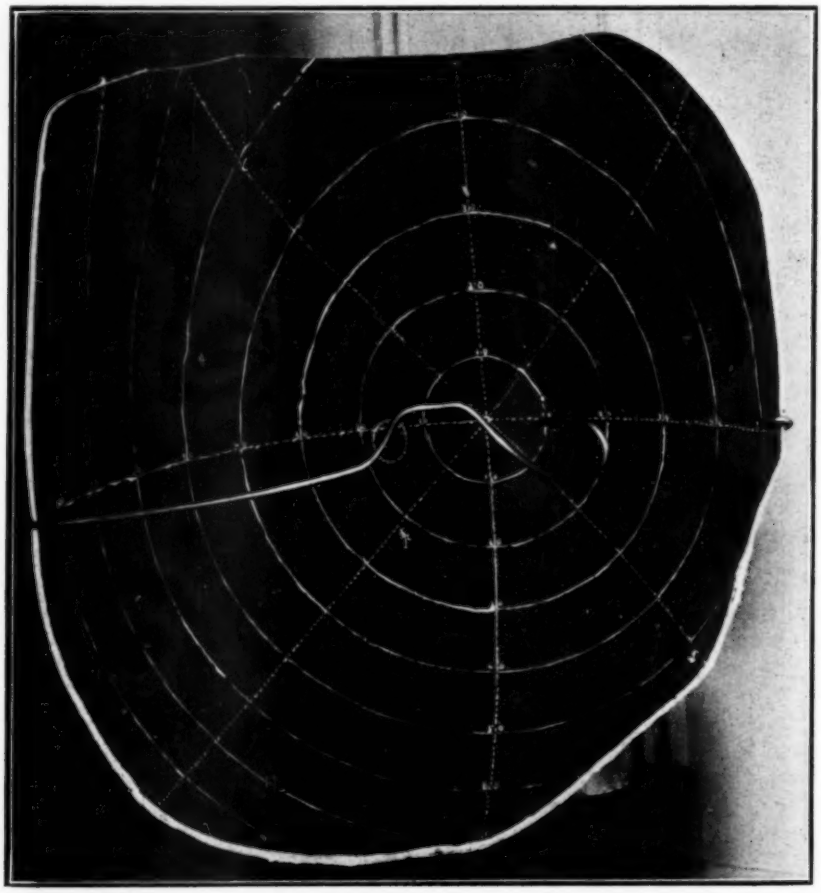


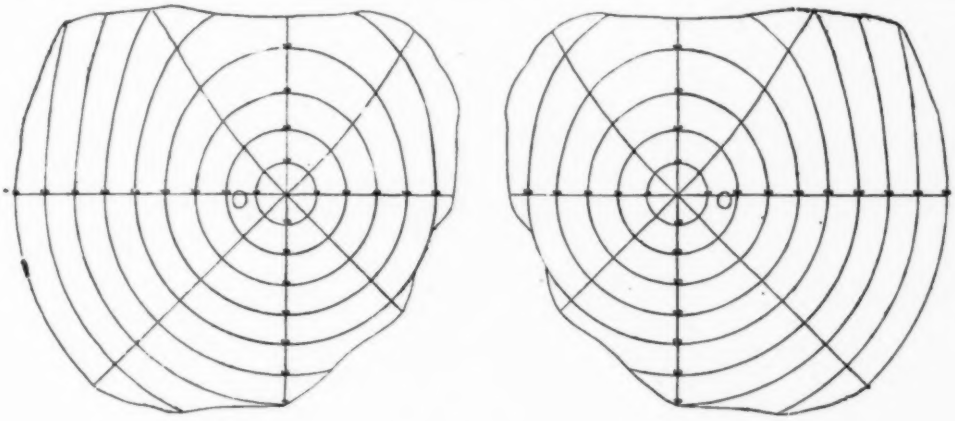
Fig. 2. Scoop perimeter enlarged to show details.

As can be seen, it is a hemispherical scotometer with the upper segment continued vertically in the shape of a cylinder. In other words, it is a scoop with the mouth up. Unlike a segment of a sphere, this cylinder has no overhanging upper lip so that a light from above and behind meets no obstacle to prevent it from illuminating the entire working surface. For all around work, daylight from a high window is best, but artificial light can be used. From above, the observer standing in front of the patient is perfectly able to watch simultaneously both the inside of the perimeter and the eye of the patient, as is essential to accurate work. The superior field is so short that within its limits the vertical meridian, tho tangent, shows no appreciable distortion.

This does away with the two objections to the hemispheric scotometer; first, the impossibility of getting uniform illumination by daylight; second,

inability to observe the working surface of the instrument without getting in the light. The illumination has been further improved by cutting away all the outer part of the hemisphere beyond the limit of the normal form field. It is not even necessary to use the maximum or absolute field of Mauthner. No patient whose lesion is so trifling as not to appear within the so-called relative field is going to demonstrate anything helpful on a larger perimeter, so for clinical work this size is perfectly adequate, and makes the instrument lighter and easier to hold. Also, by indicating the limit of the normal field, it enables an inexperienced assistant to detect at once any abnormality. At first it seemed likely that the patient would suspect the meaning of the peculiar outline of the instrument and would involuntarily strive to make his field coincide with it, thereby concealing some defect. So far, however, no one has paid any attention to the odd shape.

As the fields of the two eyes are mutually reversed, a separate scoop is needed for each eye. This arrangement gives two distinct advantages. First, it is not necessary to copy off the findings for one eye before examining the second. The transfer can be postponed until some more convenient time or given to an assistant to make. Second, as the unused eye is always on the same side, a permanent ring can be attached to the head-rest to hold a sponge or other blinder. This saves the time consumed in fastening a blinder about the head over first one eye and then the other, besides allaying any apprehension felt by the woman patient for her coiffure. The head-rest, it will be noticed, loops above the eye, resting on the brow instead of underneath on the cheek. It is, therefore, not contaminated by secretion dropping from the eye. It can, of course, be either washed or boiled.



Left eye. Right eye.

Fig. 3. Chart for recording fields taken from scoop perimeter.

For convenience in transcribing, more particularly where some untrained assistant is employed, a chart has been devised, projecting the markings of the scoop upon a plane surface. The difference is so slight, however, between the marking of the scoop and that of the ordinary perimeter chart, that these special charts are not essential.

The working distance of the hand campimeter is so familiar and popular that it was selected for this scoop and the same test objects used. Any suitable material can, of course, be used in making the scoop. Aluminum seemed ideal, but during the war it was impossible to obtain special forms of aluminum, so the scoops now in use are constructed of paper laminated over a core, which is removed when the paper is dry. This produces a

very light and rigid board. On the inside is painted a black surface. Eight diameters are indicated, also circles of ten degrees each, and the blind spot, all outlined with faint white lines. On the upper field the projection of the markings varies according to the diagram.

The scoop permits a complete field examination as quickly as the ordinary ophthalmoscopic examination, so that it can be performed as a routine measure in the office. The need of an instrument for this purpose seems to warrant presenting it to the profession.

OCULAR ANGIONEUROTIC EDEMA AND GLAUCOMA

HANS BARKAN, M. D.

SAN FRANCISCO, CAL.

The case here described seems to illustrate a form of glaucoma due to edema, and by the rarity of such cases raises the presumption that this is an unusual etiologic factor in glaucoma.

In reading the literature I have not found the syndrome mentioned as in the above title. In fact, except for the familiar lesions of the lids, there appears but one reference regarding implication of the eye itself in this disease. It seems not amiss, therefore, to report a case of unmistakable angioneurotic edema of the globe, which evidenced its existence also by attacks of glaucoma. In connection with this case, some speculation regarding the causation of glaucoma naturally arises.

Case.—Mrs. C. K., age 52, referred by Dr. H. I. Wiel. Past history: Seen in 1913 by Dr. Wiel complaining of swellings of different parts of the face, which had become more frequent since 1910, at which time they had first appeared; accompanied by ocular symptoms which she described as severe and sudden ocular pains, clouding over of all objects, haloes about lights, and intense headaches. She also had had epigastric pain and vomiting, sometimes with blood, one-half hour after eating. In 1911 appendectomy was done. For a month past she has been afflicted with swellings back of the ears or on the eyelids, or lip, or around the nose, and even on the hands. These appear suddenly and grow to such size in a short time as to disfigure her. They gradually disappear in the course of five to six hours. They usually appear in the morning when she awakens, are hard, and brawny, burn and itch. They annoy and worry her. Her stomach symptoms, as detailed, are constantly present. Further history, for which I am indebted to Dr. Wiel, states that on exploratory laparotomy, the stomach was found normal, and the gall bladder distended by thick, almost black, bile. There were adhesions to the duodenum from gall bladder region. The duodenum was constricted by a band of old, firm adhesions. When the intestines below collapsed, this band was released, and the gall bladder drained. She was dismissed from the hospital in three weeks.

When I first saw her, in 1915, she was in splendid health except for the attacks of facial angioneurotic edema, which were almost invariably complicated by the ocular complaints already mentioned. As to these, her history follows: In 1911, she consulted Prof. Hess, of Munich, regarding some occasional obscuration of vision, occurring more frequently in the right eye, without pain, injection or headache. Prof. Hess ordered an increase in her spherical correction, gave drops to be used five times a day, and a drop once at night, the latter fluid, as patient states, turned pink in color. The daughter states that these drops made the pupils very small. Prof. Hess diagnosed the case as one of glaucoma.

Six months later she consulted Prof. Hirschberg, of Berlin, who also diagnosed glaucoma and told her to continue the treatment. This she did regularly until 1913, when she discontinued the drops. While using them she had at no time obscuration of vision,

altho she was bothered somewhat by attacks of angioneurotic edema.

On the occasion of her first visit to me, her lower lip, five minutes after seeing her, increased to three times its normal size within a period of ten minutes. Her pulse rose from 79 to 102; she felt warm, confused and embarrassed, and started a profuse perspiration. When I examined her two hours later, she was quite normal in mind and body.

Ocular Examination.—External negative. Cornea clear, anterior chamber, both eyes, quite shallow. Iris deep brown color, speckled with small melanomata. Pupils normal size, round, equal, react promptly to light and accommodation. Fundus shows a slight hyperemia of both discs, veins slightly larger in comparison with arteries than usual, but both well within limits of normal variation, considering also her hypermetropia of 5 D. Fields taken on Bjerrum's chart absolutely normal, no indication of relative Bjerrum's scotoma or Seidel's sign. Vision right and left with correcting glasses of plus 5 sphere with plus 1.00 cylinder axis 90° equals 10/10. Tension right and left, Schiötz tonometer, 24 and 36 mm.

She was told that no positive diagnosis could be made from this examination and that she should telephone upon the first appearance of any obscuration of vision. A week later I saw the first acute congestive attack she had ever had. The tension was plus 3, the cornea steamy, diffuse marked congestion of the entire bulbar conjunctiva, anterior chamber almost abolished, severe headache with pain shooting down to the tip of the nose and to the teeth on the right side. Vision counting fingers at two feet. This attack started at 7:30 a. m., when she awakened with a greatly puffed-up lower lip.

The left eye was normal. Repeated instillations of eserin, and leeches applied to the temple brought her eye to normal tension; and, except for some remaining congestion of the ocular conjunctiva, to nearly normal appearance late that afternoon. Both eyes were kept under eserin for the next three days, and the usual adjuvant glaucoma treatments followed.

Seen in the office at that time, her eye was normal except for some slight congestion of the conjunctival superficial vessels, and vision was again 10/10 with normal fields and fundus.

Following this attack, I saw her eight times during the year, each time with a rise of tension varying between 35 and 40 mm. Hg. with Schiötz' tonometer, the attacks occurring invariably within half an hour after the angioneurotic edema of her lower lip, combined, occasionally with an edema of the cheeks and tongue.

During these attacks her vision dropped to 2/10 or 3/10 of normal. The field, however, did not suffer. The eye was sensitive on pressure, the anterior chamber almost absent, and the cornea slightly steamy. The attacks would invariably disappear in from three to five hours upon instillation of eserin. The angioneurotic edema would seldom last longer than an hour.

During the next year I did not see the patient again, but heard thru friends that she was completely cured, suffering neither from the edema nor from the eye condition, and that this cure had been brought about by Christian Science! In the following year, 1917, she came to the office complaining that her glasses were not strong enough for her. I found distant vision as before with her previous glasses and added the necessary presbyopic correction. Upon questioning her regarding her former troubles, she told me that during the last year and one-half she had not had a severe attack of angioneurotic edema or of obscuration of vision. She had stopped using all medicines and had devoted herself entirely to the teachings of Christian Science. Her vision during this last visit was 10/10 right and left; normal fundus and normal field. I have heard indirectly regarding her condition in the course of the last month and it is said to be the same.

The case summed up then, is as follows:

1. Typical attacks of angioneurotic edema.

2. History of gastrointestinal attacks simulating peptic ulcer, probably angioneurotic visceral edema.

3. Diagnosis of glaucoma in 1911 by Prof. Hess and Prof. Hirschberg; miotic treatment irregular.

4. Acute attack of glaucoma in connection with angioneurotic edema of lip observed personally.

5. No permanent functional ocular involvement or anatomic change from 1911 to 1918.

The association in the same individual of typical attacks of angioneurotic edema and glaucoma does not necessarily place the latter in relation with the former; when, however, the glaucoma in its acute manifestations occurs synchronously with the edema, disappears with the latter's disappearance or shortly afterwards, never lasting more than a few hours, has occurred in this fashion for seven years and has left no deleterious results; in other words, is a sudden, self-limited rise of tension, never lasting long enough to cause anatomic impairment, the angioneurotic character of the attack may be admitted.

The localization of the edema in the choroid, ciliary body, and iris, mainly, I believe, in the ciliary body, is a unique occurrence. Unusual manifestations, such as the cases reported by Bogart, of acute intestinal obstruction due to localized edema, and a case of Sanforth and Mathews of similar nature. W. J. Mayo, in three cases opened the abdomen to find localized exudative changes, all the patients recovering rapidly. The genitourinary tract is involved to some degree in about 30 per cent of all cases.

Finally, the only reference regarding ocular implications, a case cited by Albrecht, whose patient was an eighteen-year-old girl, whom he had had the opportunity of observing since the age of thirteen. With every menstrual period, which was very painful and protracted, and prostrated the patient, the right side of the face would suddenly become intensely edematous and this condition would recur repeatedly during the menstrual period. She complained of spots of light before her eyes. Fundus examination by Birch-Hirschfeld showed repeatedly marked edema of both discs which was not present in the intermenstrual period.

The case reported by me gives food for thought. Without going into the many theories regarding the causation of glaucoma, it nevertheless directs attention once more to Fischer's theory of edema caused by localized acidosis as the explanation of glaucoma. As far as I could find in the study of his chapter relative to this, he regards edema as the cause of all glaucomas, with the usually accepted causes or combinations of causes secondary. This case I do not believe to be confirmative of Fischer's opinion; but rather one in which the exception proves the rule in the proper understanding of that maxim.

Why in the many reported cases of angioneurotic edema have we not heard before of such a case as is here reported? If the edema is a localized acidosis and if glaucoma be that, it would be reasonable to suppose that an individual so afflicted with acidosis as to be subject to angioneurotic edema, would also frequently be a sufferer from acute congestive glaucoma. Yet, a thoro search has not revealed this to be the case in a single instance other than the reported case. Is the excretion of acid bodies altered during attacks of angioneurotic edema? Miller and Pepper, in metabolic studies of angioneurotic edema, by estimation of the total acidity and ammonia excretion in the urine, found that they were not. Colonel Smith, using Fletcher's method of establishing acidosis, among 1,200 troops in India, found the normal limits to vary greatly, and states that many of his glaucoma patients fall well within these normal limits established for strong, healthy men.

It seems too much to suppose, in view of the well recognized causes of certain classes and cases of glaucoma, that all these causes should only be favoring factors to the localized edema which raises the ocular ten-

sion. Are hyperopia, old age, stiffening of the sclerotic, relatively disproportionate increase of lens volume, fibrosis of the ligamentum pectinatum, high blood pressure, arteriosclerosis and sudden mental excitement all only secondary to a local acidosis, or only an aid in its appearance in a type case of this kind? Is acidosis only a phenomenon of middle or old age—the age of glaucoma? Not at all! One frequently sees particularly severe cases of real acidosis in infants, and children, but with no glaucoma as yet reported.

And where is the edema in diabetes? Of all diseases characterized by an acidosis in its grave forms, there is the one—and where is the edema? And where does one find *hypotony* of the eye most marked? In the final stage of this same nonedematous, highly-acid state! The prompt action of miotics, especially in the case reported, is hard to reconcile with the hydrophilic theory.

If an intraocular acidosis caused the sudden and internal congestive attack, the mere mechanical opening for the normal exit of normal fluid by removing the root of the edematous iris from the chamber angle would scarcely be expected to influence the acid state of the eyeball, and continuing in the degree that supposedly caused the attack, would surely not be influenced by eserin; as little as the bull's eye in acid solution could be kept from rupturing by eserin. There is simply no clinical evidence of the existence of such an intraocular acid state.

Elliot, in his textbook on glaucoma, a most thoughtful, sincere and just appreciation of the entire subject, allows himself to say only, "It is conceivable that the morbid conditions we are describing may favor that presumed state of hydrophyllism on which Fischer and his school lay so much stress," and, "The influence of hydrophyllism can, however, only be accepted with hesitation and reserve."

The objections to Fischer's theory could be carried on at length. The results, favorable and unfavorable, of operative treatment, carry perhaps the strongest objections to the mind of the clinician. Why do certain cases respond well to operative proceedings, others not at all? All of us with a liberal experience in glaucoma operations know that irrespective of the type of glaucoma, age, sex, blood pressure, urine or other clinical findings; and with equally skillful operation in all, we can divide the end results into one group that remains stationary, for long periods at least, and one group that fails in steady progression as if no operation had been performed, fail with operation, with miotics, with any kind of treatment. In the successful group, I believe that the cause lies in the anterior chamber. We touch this by operating. In the unsuccessful, it lies in the posterior half and we do not touch it by operating. Were a state of acidosis the inciting and prime agent in all glaucoma such groups as result of treatment would scarcely be expected.

BIBLIOGRAPHY

1. H. Smith. Acidosis and edema in its relation to glaucoma. Arch. of Ophthalmology, vol. 45, 1916.
2. A. Knapp. The Medical side of Glaucoma. Arch. of Ophthalmology, vol. 45, 1916.
3. Priestley Smith. Ophthalmic Review, p. 5, 1911.
4. Priestley Smith and Snowball. Royal London Ophth. Hosp. Rep., vol. 15, 1903.
5. Bradburne. Ophthalmic Record, p. 169, 1909.
6. Albrecht. Deutsche Zeitschrift für Nervenheilkunde, vol. 47-8, 1913.
7. Roth. Deutsche Zeitschrift für Nervenheilkunde, vol. 52, 1914.
8. Fischer. Oedema and Nephritis.
9. Bogart. Annals of Surgery, p. 325, 1915, vol. 61.
10. Osler and McCrae. Modern Medicine, vol. 5.
11. Danforth. Interstate Medical Journal, p. 812, 1916.
12. Wiel. Journal A. M. A., vol. 57, 1912.
13. Henoch. Berliner klinische Wochenschrift, 1874, no. 51.
14. Briggs. Journal A. M. A., February, 1918, p. 528.
15. Matthews. Northwest Medicine, vol. 16, 1917.
16. Miller and Pepper. Arch. Int. Med., 1916, p. 550.
17. Quincke. Wochenschrift für practische Dermatologie, July, 1882.
18. Elliot. Glaucoma.

OPHTHALMOLOGIC PARIS

MAJOR CHARLES A. BAHN, M. C., U. S. A.

NEW ORLEANS, LA.

This account of what has been done and planned for the immediate future, in the way of graduate teaching in ophthalmology in Paris, is published under authority from the Surgeon-General's Office, U. S. A.

With the return of civilian transportation facilities, the beauty, charm and location of Paris, combined with its great teaching and clinical facilities, will attract more than ever before American ophthalmologists, as clinic visitors and for definite postgraduate study.

Before the war, didactic and clinical French courses were given in our specialty at the Hotel Dieu (University of Paris), by Professor de Lapersonne and staff, as well as at the hospitals Lariboisiere, Necker, Enfants Malades, Laennec and Rothschild, by Doctors Morax, Magitot, Poulard, Rochon-Duvigneaud and Dupuy-Dutemps. These included external diseases, ophthalmoscopy, operative and laboratory technic, pathology, diagnosis, etc. They offered the postgraduate students excellent and practically continuous instruction from November to May. With modifications, these courses are being resumed.

A movement is now in progress to organize postgraduate medical teaching in English and other languages. Should the number of students justify, it is probable that by 1920, one will be able to obtain didactic and clinical ophthalmologic instruction in our language sufficient to justify the trip from an educational standpoint.

There is no reason why Paris should not be the future ophthalmologic capital of Continental Europe. It has the teachers, the clinics and the facilities. Lacking only is the teaching organization, which is now in the process of formation.

The Army Educational Commission has made it possible for many in the service to avail themselves of the educational advantages of France. In this city ophthalmologic instruction was arranged at the hospitals Lariboisiere, Grand-Palais, Hotel Dieu, Enfants Malades, etc.

The important and difficult work of bringing Franco-American medical educational facilities into closer contact has been under the direction of Colonel Samuel Lloyd, of the Medical Corps, U. S. A. The future success of Paris as a postgraduate medical center for Americans will in no small way be due to his untiring and efficient efforts.

The city has largely returned to its pre-war appearance and habits. Current prices are, however, a constant reminder of the new era. Bare living expenses at this time cost the average American officer about $150.00 per month, and incidentals from $50.00 upward. Diagnostic instruments are expensive and difficult to obtain, hence it is advisable to bring ophthalmoscopes, etc. Naturally, a knowledge of French is most desirable; tho at most of the hospitals some member of the staff speaks English.

The following information concerning the several eye clinics, which, with the exception of the Rothschild Foundation, form a part of general hospitals, is given to assist prospective visitors in making necessary arrangements and employing their time to the greatest advantage.

HOTEL DIEU

Place du Paris, Notre Dame. Subway Station, Métro. "La Cité."

Professor F. de Lapersonne, University of Paris; Associate Professor F. Terrien. Chief of Clinic, Dr. Velter and others. New cases, 14,444; operations, 879 in 1918. 100 beds. Consultations, daily at 9 A. M. Operations: Tuesdays, Thursdays and Saturdays at 9 A. M. Courses in French:

1. Weekly lectures each Friday, 10:30 A. M., by Prof. de Lapersonne. No charge.

2. "Practical course"; Orbito-Ocular Surgery in 10 lessons, with demonstrations on the cadaver, November and March, 50 francs.

3. "Perfectionment"; Review of Ophthalmology in 30 lessons, six weekly; with demonstrations in dark room and laboratory, as well as on the cadaver. November and May, 100 francs.

4. "Vacation"; 15 lessons and demonstrations, September. 50 francs.

No member of the present staff speaks English.

The clinic, wards, operating room and laboratory are large and well adapted for teaching purposes.

Quite a few of our officers here attended the courses Nos. 1, 2 and 3, with benefit.

LARIBOISIERE

Rue Ambroise-Pare. Métro, "'Gare du Nord."

Chiefs of service, Drs. V. Morax and A. Magitot. First assistant, Dr. J. Bollack.

New cases, 14,122; operations, 1,268 in 1918. 60 beds.

Consultations: Mondays, Wednesdays and Fridays at 9 A. M. Operations: Tuesdays, Thursdays and Saturdays at 9 A. M. Courses in French.

1. Weekly lectures each Saturday, 11 A. M., by Dr. Morax. No charge.

2. "Ocular Physiology"; including circulation, tension, iris, visual centers, nerves, etc.; February, 1920. 100 francs.

3. "Ophthalmic Surgery"; Drs. Morax and Magitot. March, 1920. 120 francs.

4. "Refraction"; Date depends on demand. 100 francs.

5. "Perfectionment"; Brief resumé of advances made during the year. Five days following the French Ophthalmological Congress in May, 1920.

6. Laboratory Technic.

7. Ocular Neurology; Dr. Bollack. 100 francs.

Drs. Morax, Magitot and Bollack speak English.

Systematic postgraduate ophthalmic instruction in English and possibly Spanish is being arranged to begin November, 1919. These courses will probably be excellent, extend over three months and be repeated in January and April, 1920. They will be given conjointly by the chiefs of service at the Hospitals Lariboisiere, Enfants Malades, Laennec and possibly others. Details may be had from Dr. Magitot.

The entire service, modern, well arranged, and adequately equipped, is much like our American clinics and has been very popular with visiting officers interested in ophthalmology. We are deeply indebted to Drs. Morax and Magitot, who have shown a great interest in our students and who have given us their time and efforts without stint or reward. They have, indeed, done much toward making our stay of professional value.

QUINZE-VINGT

28 rue Charenton. Métro, "Bastille."

Chiefs of service, Drs. A. Chevallereau, M. Kalt, G. Chaillous, E. Valude. First assistants, Drs. H. Liegard, A. Fourrier and Perossier. Aid of clinic, Dr. J. Lemologlou.

Approximately 18,000 new cases and 2,000 operations in 1918. 100 beds.

Consultations: Daily at 9 A. M. and 2 P. M. Operations: Four days weekly, at 2 P. M.

No courses are given except a weekly French lecture by one of the staff. Dr. Lemologlou speaks English.

The clinic is compact and well arranged. Our officers, who have been most kindly received and shown every possible courtesy here, have shown their appreciation by the frequency of their attendance. The hospice, of which the clinic forms a part, was founded by Louis XII, and serves as a home for 300 blind, with their families.

ENFANTS MALADES

149 rue Sevres. Nord-Sud, "Falguieres."

Chief of service, Dr. A. Poulard; assistants, Drs. Offret and Boussi. Interne, Dr. Merigot de Treigny.

New cases, 6,220; operations, 510 in 1918. 30 beds. Consultations: Daily, at 9 A. M. Operations: Monday, Wednesday and Friday, at 9 A. M. Courses in French.

1. "Practical Course"; for students and physicians, January and June. Monday, Wednesday and Friday.

2. "Complete Course"; to be given in collaboration with Drs. Morax, Magitot, Rochon-Duvigneaud and Dupuy-Dutemps, at Hospitals Lariboisiere, Laennec and Rothschild.

3. "Ocular Surgery"; 100 francs.

4. "Facial Restoration and Ocular Prothesis"; with demonstrations and technic. No charge.

Courses in English; see Lariboisiere. Drs. Poulard and Merigot de Treigny speak English. The clinic is compact, well equipped and organized.

The course on Facial Restoration and Ocular Prothesis with demonstrations of photographs, diagrams and autochromes so kindly given by Dr. Poulard, has been of great value and interest.

NECKER

The Eye Department is in conjunction with the Hospital Enfants Malades.

GRAND PALAIS

10 rue de la Paix.

Chief of service, Dr. Louis Borsch.

The clinic of this military hospital, since closed, was placed at the disposal of the officers; excellent instruction was given under Captain Ayers.

Dr. Borsch has shown many courtesies and kindnesses to our visiting officers. Many will recall that our colleague and countryman lived in Philadelphia for many years.

ROTHSCHILD

86 rue Manin. Métro, "Bolivar."

Chief of clinic, Dr. L. Dupuy-Dutemps. Chiefs of services, Drs. Rochon-Duvigneaud, E. Millee, C. de Speville.

New cases, 38,000 (approximately); operations, 900 in 1918. 100 beds.

Consultations and operations at 9 A. M. and 1 P. M., daily.

Under the provisions of the founder's bequest, only very limited instruction is permitted. This is given in collaboration with the Hospital Lariboisiere and others. Dr. de Speville speaks English.

The hospital occupies the largest, most modern and perhaps the best equipped building used for ophthalmic purposes in Paris. Among the interesting features of the institution are the laboratory work of Dr. Mawas and the many ingenious devices of Dr. Pollack.

LAENNEC

42 rue de Sevres. Métro, "Sevres."

Chief of clinic, Dr. A. Rochon-Duvigneaud. Assistants, Drs. Coutela and Rene Onfray.

New cases, 3,300 (approximately); operations, 150 in 1918.

Consultations daily at 9 A. M. Operations, Wednesdays at 9 A. M.

Instruction given in collaboration with Hospital Lariboisiere.

Dr. Onfray speaks English.

The clinic, tho small, is very well organized. Of great interest is the operative technic and pathologic work of Dr. Rochon-Duvigneaud.

BEAUJON

208 rue Faubourg, Saint-Honoré. Métro, "Alma."

Chief of service, Professor F. Terrien.

SAINT ANTOINE

184 rue du Faubourg, Saint-Antoine. Métro, "Reuilly."

Chief of service, M. Dupuy-Dutemps.

VAL-DE-GRACE

277 rue St. Jacques. Métro, "St. Jacques."

Chief of service, M. Kalt.

The clinic is practically limited to military cases. A most interesting feature of the hospital is the large collection of military pathologic specimens.

BRAZILIAN

389 rue Vaugirard. Nord-Sud, "Convention."

Chief of service, Dr. F. Lemaitre.

An excellent course on facial restoration was given there by Dr. Lemaitre, who has been in the United States.

LANDOLT

Dr. E. Landolt, 8 rue de Berri, Métro, "Alma," generously gave a most interesting series of lectures and demonstrations on Refraction and

Muscular Anomalies. We were greatly endeared to this distinguished ophthalmologist by his keen wit, charming personality and special interest in Americans. Dr. Landolt speaks English.

More detailed information may be readily obtained by writing Drs. Morax, Magitot, Borsch, Poulard, Landolt or Merigot de Treigny, whose addresses have been mentioned with their respective hospitals, and who have kindly volunteered to assist our visitors in any possible way.

It would be indeed ungrateful to close without acknowledging our deep appreciation to the members of the various clinics for their many courtesies; to Captain Boulanger for the assistance derived from his booklet, "Paris Hospitals"; and to the Medical Department of the American Expeditionary Forces for the great opportunities and for the excellent facilities placed at our disposal.

The writer believes that at this time the best fundamental postgraduate ophthalmic training for Americans is to be had in America, but for those who desire a supplementary European education, Paris offers more and greater advantages than any other city of Continental Europe. For those who contemplate definite postgraduate study here, excellent courses to be given in English are being arranged, to commence about January 1, 1920. For those who contemplate visiting European clinics, a few weeks cannot be spent to greater professional advantage than in the several eye clinics of Paris.

TREATMENT OF SYMBLEPHARON AND RESTORATION OF THE ORBITAL SOCKET

WILLIAM H. WILDER, M. D.

CHICAGO.

The method here described is one found valuable by extended experience. This general plan of procedure, using different substances to preserve the full extent of the socket has come into prominence in the treatment of war injuries. Presented before the Section on Ophthalmology, American Medical Association, June, 1919.

Symblepharon may present such a variety of degrees that the correction of the difficulty will require varying degrees of ingenuity and technic on the part of the ophthalmic surgeon. Strictly speaking, the term "symblepharon" is reserved for those cases in which the eyelid has become adherent to the eyeball.

The degree of the adhesion varies from the simplest form in which the edge of the eyelid, or part of it, is attached to the eyeball, and to this the term "anterior symblepharon" is given. In the more extensive form in which the culdesac or fornix of the conjunctiva is involved we have so-called "posterior symblepharon." When the whole surface of the eyelid is attached to the globe and the fornix is obliterated, we use the term "total symblepharon," and this may affect both lids after extensive burns or injuries, all of the conjunctiva being destroyed.

In severer degrees of this kind, the edges of the lids also may have been destroyed so that they will have grown together, giving the condition of ankylosymblepharon. In these severer forms, especially if caused by extensive injury or burns of the conjunctiva, the eyeball has in most cases been removed; but in some the atrophied, shrunken bulb may be present; and the surgeon should consider this in his treatment.

The causes of this condition are usually traumatic, as from burns of the conjunctiva with acids, strong alkalis, molten metal, lime, gas flames, or other strongly irritating substances that occasion ulceration of the conjunctiva.

Certain diseases, such as pemphigus, diphtheria, and even long continued trachoma, may cause such destruction and contraction of the conjunctiva that the culdesacs will be obliterated and a condition produced as bad as that made by a severe burn.

Although, strictly speaking, as has been said, symblepharon means the adhesion of the eyelid or eyelids to the eyeball, the same term may properly be applied to the adhesion of the lids to the tissues of the orbit after the removal of the eyeball, for in such cases the conjunctival sac is obliterated and prevents the use of an artificial eye. Milder degrees of this condition result from destruction of too much conjunctiva in careless enucleations. Continuous wearing of ill fitting glass eyes that irritate the conjunctiva may cause bands of scar tissue that will seriously contract the culdesacs.

More severe forms follow destruction of the eyeball and the orbital tissues from deep burns or injury of this region by explosion or shell wounds. In the healing of such wounds, large, firm masses of scar tissue are formed which bind the lids firmly to the deeper structures. These cases of total symblepharon are the kind that were regarded as incurable by the older ophthalmic surgeons. Arlt had no operation for them. Knapp had seen no more than temporary improvement in the treatment of them, and regarded the condition as hopeless. Fuchs[1] says: "Cases of extensive symblepharon posterius, and obviously also cases of symblepharon totale, are incurable. The same is true of symblepharon induced by the gradual shrinking of the conjunctiva."

The problem in the treatment of these cases is the same, altho modified by the degree of the condition, and that problem concerns the restoration of the conjunctival culdesac or one that simulates it. If the eyeball is present, the culdesac is to be restored to allow mobility and prevent the irritation of the eye by the dragging on the adhesions. If the eyeball is absent, the culdesacs are to be restored to furnish a socket for the comfortable wearing of a prosthesis.

EARLY TREATMENT FOLLOWING BURNS OF THE CONJUNCTIVA TO PREVENT SYMBLEPHARON

When the eye is burned severely by chemicals, by gas flames or by molten metal splashing into it, the part of the conjunctiva affected is usually destroyed at once and in a few days sloughs off. Such a burn corresponds to a second degree burn of the skin, and the amount of damage done to the parts beneath the conjunctiva will naturally depend on the degree of the heat that strikes the part, and the length of time it acts. Usually a very small quantity of fluid chemical substance gets into the conjunctival sac, and this may be more or less neutralized by the copious supply of tears that is thrown out.

With burns from gas flames, the prompt closure of the lids protects the conjunctiva to a certain extent, and the greater part of the injury is done to the outer surface of the lids, altho the cornea and ocular conjunctiva may suffer. When molten metal gets into the eye, altho the quantity may be small, the spasm of the lids may hold it firmly in the conjunctival sac, where it continues to burn the tissues with which it is in contact until its heat is lost. As a result, the destruction may be deep.

In any such case in which the conjunctiva is destroyed in whole or in part, the eschar must be cast off before healing can begin. Granulation tissue develops to replace the lost substance, and from this fibrous or cicatricial tissue forms. Two granulating apposed surfaces will certainly grow together in spite of frequent attempts to separate them unless epithelium forms over the surface to prevent it. But it is just in such cases as these, in which the tissues have been injured by heat or the corrosive action of chemicals, that the regenerative power of the epithelium seems to be impaired.

It is at this stage that the surgeon can come to the help of nature and by aiding in the epithelization of the wound prevent much of the cicatriza-

tion that will inevitably produce great deformity if not checked. As soon as it is evident that the wounded surface is clean and granulation is well under way, attempts should be made to cover the raw surfaces with epithelium, for the sooner this is accomplished the sooner will the formation of cicatricial tissue be checked. The general surgeon, recognizing this principle, covers denuded areas that cannot be accurately apposed as soon as possible with thin layers of epidermis. This can be done at the time of operation if cutaneous tissues have been sacrificed, but in case of loss of tissue from burns or corrosives, he must wait until it is evident that repair is beginning after the shock to the tissues.

In the case of the injured conjunctiva, the difficulty of accurately implanting thin grafts of epidermis or mucous membrane is greater than would be encountered on most surfaces of the body. Again, if the eyeball remains, and is not too badly injured to require removal, the integrity of the cornea must be carefully considered in any reparative means to be employed.

These difficulties can be overcome by the use of suitably prepared plates conforming to the shape of the eyeball and to the conjunctival sac to hold the layers of epithelium smoothly in contact with the raw surfaces. The device employed must be such that it will not injure the cornea.

A glass plate or porcelain shell with a curvature like that of the eyeball, as recommended by Morton[2] and May[3] has been succesfully employed. Hotz[4] employed a thin lead plate for the purpose of holding the graft in place. H. W. Woodruff[5] used a sheet of block tin cut to the required size and molded to the proper curvature. But whatever material is used for the support, it is well to have a circular opening in the plate at least the size of the cornea; and to insure the least possible irritation of the cornea, the plate should be coated with a layer of hard paraffin of a melting point of 130 or higher, if it can be obtained. I[6] first described this device in a paper presented to this section in 1906 (Fig. 1).

My preference is for a plate made of a sheet of block tin about 1 mm. thick, which can be easily sterilized and fashioned with knife, scissors and file to the required shape and size, so that it will fit into the culdesac above and below. The paraffin to cover it should be hard so that it will not soften down too much by the heat of the body and be thrown into ridges or hummocks by the movement of the lids. Repeated boiling of such paraffin will raise the melting point and make it harder.

To coat the plate, after it has been made the proper shape and size and sterilized, it is held by its edge with light forceps and dipped quickly into the melted paraffin contained in a wide mouthed vessel like a graduate glass. This vessel with the melted paraffin should be in a dish of hot water to prevent congelation or thickening, otherwise the layer of paraffin deposited on the plate will be uneven. The thin layer that adheres to the metal can be quickly set by dipping it into cold water, and it can be repeatedly dipped into the paraffin and into the water until it has an even coating of the proper thickness.

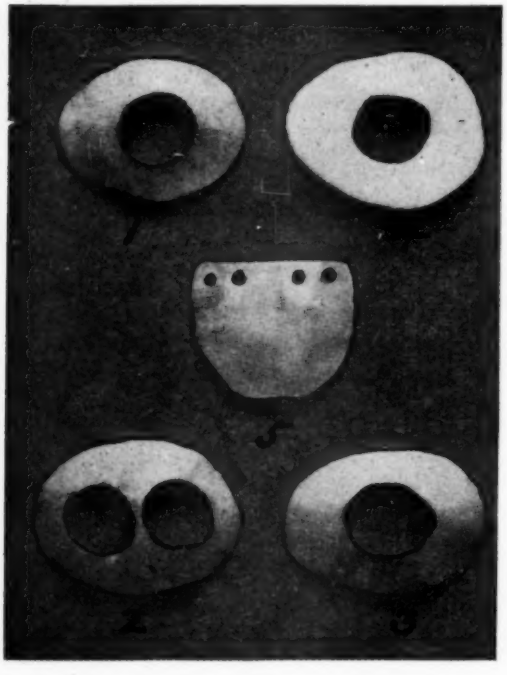
Such a smooth paraffin-coated plate offers little irritation to the eyeball, even if the cornea is intact, and can be safely employed to keep the raw surfaces of the eyelids separated from those of the eyeball during the healing following a burn of the conjunctiva.

But this alone is not sufficient. As soon as the eschar has been cast off and granulation has begun, attempts should be made to restore epithelium to the injured area, and this can be done in the form of mucous membrane or of thin grafts of epidermis which are held in place by the plate. Naturally, mucous grafts are preferable for this situation, and if the area to be covered is not too large, suitable ones can be cut with the section razor from the inside of the lips, or from the inner surface of the labia or vagina in women.

Hotz[7] was one of the first to advocate that thin Thiersch grafts from the

less hairy parts of the skin are suitable for replacing the conjunctival culdesac in symblepharon. C. H. May[3] reported the successful use of Thiersch grafts, held in place by thin porcelain plates, in an operation for total symblepharon performed in 1897.

When mucous grafts are not available, and usually they are not, Thiersch grafts may be employed. In



In the illustration, 1 and 3 represent block tin plates prepared for the symblepharon operation, the cornea being present; 2, a plate used for restoring culdesac for prosthesis; this would be coated with paraffin; 4, a similar plate coated with paraffin; 5, plate to be sewed to the lid in the method of Hotz and Woodruff.

cases such as those we are considering, these grafts should be cut very thin from the inside of the arm with a flat back razor such as is used for section cutting. The thin strip of epidermis, which should be larger than the area to be covered, should be transferred directly from the razor to the paraffin plate, over the edge of which it is folded with a spatula or with the gloved fingers, the raw surface being outward. It adheres well to the paraffin surface and can be smoothed out so that no wrinkles are present, and its position on the plate can be shifted as desired.

During this gentle manipulation of the graft, an assistant should keep it moist by dropping warm saline solution on it. The plate should then be carefully inserted into the culdesac, an assistant helping with retractors, the graft-covered edge being the first introduced. If the two culdesacs are treated at the same time, the lower graft can be held more firmly to the plate by a couple of fine sutures passed thru its edges at suitable points and the hole in the plate. This prevents it being wiped off or displaced when it is inserted.

If the plate has been properly constructed and the operation carefully performed, the raw surface of the graft will be perfectly coapted to the raw surface of the lid and the culdesac, and should adhere firmly. If the cornea is denuded at any point, it would be well to defer the application of the graft until epithelium has formed over the denuded cornea, or to limit the graft to the raw surface of the deeper part of the culdesac. An attempt could be made at a later treatment to cover the raw surface of the lid that is likely to come into contact with the cornea, with a mucous graft applied on the plate in the same manner. The culdesac should receive the first attention.

Early attempts at covering the raw surfaces with epithelium in this manner, as soon as it is evident that the tissues are undergoing healthy repair, will do much to prevent serious symblepharon that later would require more extensive operation.

Once symblepharon has occurred, the method of treatment will depend on the degree of the condition. In simpler cases in which the eyelid is attached to the eyeball at one point, the operation of Arlt may be sufficient, or a more extensive adhesion may require the covering of the defect on the eyeball with flaps of conjunctiva, which may be done after the well known methods of Teale or Knapp.

But if the loss of conjunctiva is too great to allow covering with conjunctival flaps, recourse must be had to grafts of mucous membrane or epidermis, and these must be held in place by some kind of conforming plate.

In preparing the culdesac for the graft by dissecting the lid from the eyeball, it is important that the incision should follow close to the tarsus, if that is left, so that the lid will not be too thick. Scar tissue on the eyeball or lid or fornix should be trimmed off if possible, and it is well to err on the side of making the culdesac too deep rather than too shallow. The graft that is used should be in one piece and somewhat larger than the area to be covered. No sutures are necessary, for the plate should hold it well in place. It adheres only to the raw surface; the overlapping edges are either cast off or can be trimmed away later at one of the dressings.

RESTORATION OF THE ORBITAL SOCKET FOR PROSTHESIS

Here again the problem is that of lining with epithelium the culdesac that is made after dissecting the lids free from the orbital tissue, which is usually badly scarred. Uhthoff[8] says that in 600 eye cases seen by him during the war, 11 percent were wounds of the orbit, and that in numbers of cases of plastic operation on the lids and conjunctiva he was able to make possible the wearing of a prosthesis. He emphasizes the importance of prompt and accurate sutures of wounds to prevent the formation of cicatricial tissue.

Poulard and Réal[9] describe a means of holding a gutta percha plate firmly in the upper culdesac so as to prevent bands of cicatricial tissue from obliterating it. The plate is fashioned from a model of a wax impression of the orbit and then is mounted on the small arm of an apparatus fastened around the head. The arm holding the plate is adjustable so that when the apparatus is in position, pressure will be made on the part of the orbit desired to hold the prosthesis.

Morax,[10] commenting on the difficulty of obtaining a new cavity for prosthesis in total symblepharon, offers a new operation. The lids are cut loose from the underlying tissue to which they are attached, in such a manner that they form large flaps, which are everted and stitched to the skin above and below. The exposed raw surfaces are then covered with wide epidermal grafts. At the end of three weeks the flaps are released and sutured together over a plate of enamel or lead. This remains for six weeks or longer, and then the lids are separated and the socket is ready for the prosthesis.

Various methods have been devised and practiced for forming the new culdesac of pedunculated flaps or skin from the parts adjacent to the orbit. Maxwell[11] uses a bridge flap from the cheek to restore the lower culdesac. Schwenk and Posey[12] use a pedicled flap from above the brow to line the upper culdesac, and combine this with a Maxwell operation for the lower culdesac. Danis[13] describes an ingenious operation in which he uses a temporofrontal pedicled flap for restoration of the lower culdesac.

In all such operations a conforming plate must be used to hold the flap well in position, and it is best to have one or more small openings in it to allow for drainage and cleansing. The most important part of the problem is to prevent the subsequent contraction of the culdesac. To approach a solution of this it is necessary, first, to make the dissection deep enough. It should extend to the margin of the orbit, so that the periosteum may be seen. Secondly, it is necessary to dissect away all scar tissue that will tend to cause retraction of the culdesac. In order to accomplish this it is best to make a free division of the external canthus, and with this help a larger plate can be inserted. For such cases there is an advantage in having the graft firmer than the thin Thiersch grafts used for simple cases. The grafts can be cut so as to include more of the corium, and, if desired, when the plate is in position, one or more loop

sutures, armed with two needles may be passed thru the graft at the bottom of the culdesac and made to pass thru the periosteum before emerging on the cheek, where they are tied over a roll of gauze. This is the value of the operation of Weeks, who restores the culdesacs with Wolff grafts which are secured in place by sutures which anchor it to the periosteum and emerge on the cheek.

The paraffin plate alone cut to the proper size is usually sufficient and forces the graft evenly into every part of the pocket. The canthus should be restored with sutures and a moist dressing applied. The plate is not removed for several days, at which time the grafts will be rather firmly adherent.

The socket can be irrigated thru the opening in the plate. Care should be taken in removing it that the graft is not torn away, but it usually slides out easily. If there is difficulty in reinserting it, it may be trimmed slightly, or it may be cut in two along the horizontal middle line and hinged by boring small holes at proper points and uniting the two halves with firm silk or small wire. Each half is then coated with hard paraffin as before, and it can be reinserted.

Some form of plate, and as large a one as possible, should be worn for several weeks to hold the shape of the new culdesac. The paraffin plate irritates the new socket as little as anything I have used. For such restored sockets, artificial eyes should be especially made, the ordinary ones making irregular pressure and tending to cause the development of scar tissue.

BIBLIOGRAPHY

1. Fuchs' Textbook of Ophthalmology, 5th Edition.
2. Morton. Ophthalmic Record, August, 1898.
3. May. Arch. of Ophth. v. 28, p. 182, 1899; and Arch. of Ophth. v. 30, p. 471, 1901.
4. Hotz. Ophth. Record, November, 1899.
5. Woodruff, H. W. Annals of Ophth., March, 1903.
6. Wilder. Jour. Amer. Med. Assn. v. 47, p. 571, 1906.
7. Hotz. Annals of Ophth., April, 1893.
8. Uhthoff. Berl. klin. Woch. 1916, No. 1. Abst. Clin. Opht. 1917, p. 233.
9. Poulard and Real. Ann. d'Ocul. v. 155, p. 41, 1918.
10. Morax. Ann. d'Ocul v. 154, p. 494, 1917.
11. Maxwell. Ophthal. Rev. v. 22, p. 121, 1901.
12. Schwenk and Posey. Trans. Amer. Ophth. Soc. v. 16, p. 178, 1918.
13. Danis. Ann. d'Ocul. Feb. 1916.

VISUAL DISABILITY FROM EYE INJURY AND COMPENSATION

SAMUEL G. HIGGINS, M. D.

MILWAUKEE, WIS.

This report prepared for the Milwaukee Oto-Ophthalmic Society on visual disability from eye injury and compensation to be allowed by the Wisconsin Industrial Commission, was read before the Chicago Ophthalmological Society, May, 1919.

The need for a table or working plan for the adjustment of compensation to employees for eye injuries was brought to the attention of the Milwaukee Oto-Ophthalmic Society by a set of direct questions submitted by the Industrial Commission of Wisconsin. The commission stated that they desired to govern their decision by our replies.

The questions asked us were these:

First. Is a table recording vision by reading the Snellen test type letters practical?

Second. Is there a compensation disability accruing to the man whose vision has been impaired by accident, but with the use of a clear lens may be brought to normal?

Third. What is the compensation disability of an employee whose injury has caused a dilation of the pupil and who is required to constantly wear a colored lens?

Fourth. What is the compensation disability accruing to the employee where the injury has caused a cataract and the loss, in addition to loss of vision, includes loss of power of accommodation?

Fifth. What is the compensation disability in case of double vision?

Other questions arising in the day's work of the commission were mentioned. One requiring the judgment of an ophthalmologic jury or court is that concerning the compensation disability accruing to that employee who sustains a traumatic cataract and who refuses operation for removal of the cataract.

The essence of the whole discussion is to establish an equitable settlement by the Commission, according to the enacted law for compensation for eye injury. To do this a mutual understanding of the position of the commission and of the logic of the physicians is essential. The commission informed us that the special legislative committee of 1909 recommended a Workmen's Compensation Act which was passed in Wisconsin in 1911, amended in 1913, 1915 and 1917 and that further amendments are before the legislature now in session. Oculists, as citizens, may suggest amendments, or aid in legislative passage. At present the report requested of the physician or oculist is regarding the disability; and the business of the commission is the awarding of the compensation which may be legally and justly allowed for such disability. In other words, we may state our opinion as to the injury in terms of disability or loss of vision and the commission may state its opinion in terms of compensation or money allowed therefor.

There is written into the law of Wisconsin to date a schedule of fixed benefits, stating that the compensation to be paid shall be 65 per cent of the average weekly earnings of the employees for the period named in the schedule, to-wit:

The loss of an eye by enucleation, 160 weeks.

The loss of the second eye by enucleation, 320 weeks.

Total blindness of one eye, 140 weeks.

Total blindness of the second eye, 280 weeks.

It may be of passing interest to know that the award for total deafness of both ears is 160 weeks; total deafness of one ear, 40 weeks; total deafness of the second ear, 120 weeks. Also that the award for the loss of one arm at or near the shoulder is 240 weeks; and the loss of a hand is 160 weeks, and that the loss of a foot at the ankle approximates the award for the loss of an eye, being 120 weeks.

The figures are mentioned in view of the testimony of physicians whose

sworn opinion held that a man, whose vision was reduced by injury to 20/40, should receive one-half of the 140 weeks' pay, the 140 weeks representing compensation for the total loss of vision in one eye. It may be the honest opinion of the physician that a man should receive 70 weeks' pay for the risk, pain and suffering and 20/40 vision due to an eye injury, but risk, pain, suffering, etc. are not written in the law and are not compensated for.

There are other legal limitations to our discussions in Wisconsin, viz: that at present the law does not mention the nature, kind, nor character of the occupation of the injured employee, nor compensating him with that in mind. Neither is there a provision requiring information concerning the vision in either eye of the employee before the injury was sustained. The physicians in Wisconsin have the pleasure of acknowledging that the interpretation of the disabilities, due to eye injury, and the amount of compensation allowed by the commission, always attempted to be fair and liberal.

Having learned the position of the commission the Society wished to inform the commission of their rights and stand. In the first place the Society was unanimous in stating that the vision which is recorded 20/40 on reading a certain line of Snellen type, does not represent vision which is ½ of total blindness. They further thought that a table could be agreed upon by the oculists in this Society and other Ophthalmological Societies which would be interpreted in terms of amount or portion of loss of vision. However, due to the intricate factors associated in the visual act and disturbances of these by an injury, the process of employing and enjoying vision is subject to more variances and interpretation than can be expressed in any one table. Therefore, the visual disability must be submitted to the commission by the testimony of one or more oculists in each given case. That further the commission could not in all cases accept the recording by the Snellen method of loss of vision in one eye, to be the full equivalent of visual disability without an opinion or explanation of visual disability by an oculist.

The table approved by the Milwaukee Oto-Ophthalmic Society is similar to the state law in one respect and that is that it may be amended. We are anxious to meet with and accept your table or suggestions where we can simplify our answers to the commission and further submit a scheme or plan which may be understood by all parties concerned. By reference to the recent reports it is found that we all agree that what we record as 20/40 vision does not represent one-half either of normal vision or total blindness. In the Milwaukee table 20/40 vision represents 94% of vision or a 6% loss of vision.

Dr. Prince and others, in Springfield, agree on a basis of settlement of 100 weeks for total loss of vision—that for partial loss of vision of 20/40, five weeks should be awarded. That is practically 5/100 of 100 weeks or 5% of the award for total loss of vision.

Dr. Chapman's table presented to the American Academy of Ophthalmology and Oto-Laryngology, in Pittsburg in 1917, allows that 20/40 is 90% of vision or a loss of 10%.

Dr. Frank Allport suggested in conversation that if an accident insurance policy allowed $2,000 for blindness, an injured man with 20/40 vision should receive an award of $400.00. That would be 400/2000 of the amount for blindness or 20/100, or may I say this is 20% of the total award.

If compensation measures disability, we have an expression of 20/40 vision in these various tables of 3%, 5%, 10% and 20% of the amount to be awarded for total blindness. The Milwaukee Oto-Ophthalmic Society have in mind adding two large letters to the Snellen chart, one to read 20/310, said to be equal to 84% loss of vision, and one 20/350; said to be 100% loss of vision, or industrial blindness.

Perhaps the report of the Committee of the Chicago Ophthalmological Society recommending 5/100 as industrial blindness would be more prac-

tical. I am told that the army standard is 5/200 which may be even more easy of application and a fairer measure. Dr. Prince puts down nil for total blindness, and awards 75 weeks for 10/200 vision. Dr. Allport would allow $1,200 for 20/200 vision when the award for total blindness is $2,000. May I not assume that we are willing to set some sort of light perception or reading of visual acuity as Industrial Blindness?

To refer to first principles again, I may say that it seems to me that an Industrial Commission or jury or legal court are inclined to accept a visual acuity record as an expression of visual disability.

With this in mind we proceeded with direct answers to the question submitted to us. We also recalled the arguments with the optometrists regarding the prescribing of glasses in which we held that to be a medical act. We believe that defective vision due to trauma should be restored by lenses to be prescribed. Therefore, the vision is taken without and with glasses. The better vision of the two is that recorded.

Question number two raised by the Commission is: What compensation disability, if any, is accruing to the man whose vision has been impaired by accident, but with the use of a clear lens may be brought to normal? The answer is that he is entitled to a disability amounting to one-half of the difference between his vision without correction, and with correction, plus any defect remaining after corrective glasses are given.

To illustrate, a man with vision after accident without glasses is 20/200, with glasses 20/40. The disability of 20/200 vision we scaled at 54% loss, disability at 20/40, at 6% loss, his disability then would be one-half of the difference between 54 and 6 which is 24. His award would be based upon 24% loss of vision. Should his vision be 20/200 without glasses and 20/20 with glasses the total disability would be one-half of that awarded for 54% loss of vision. This is an unlikely case but for the wearing of a high astigmatic lens we considered he still is 24% disabled.

Question number 3, refers to a permanently dilated pupil requiring the wearing of tinted or colored lenses. After some discussion this was agreed to be 5% disability. This would be added to other disability present.

Question number 4, refers to compensation disability accruing to the employee where the injury has caused a cataract; and the loss, in addition to vision, includes loss of power of accommodation. The Society held that the question should have also stated that the loss included both the loss of power of accommodation and the loss of binocular vision. An arbitrary figure of disability was held to be 50% with the additional disability represented by vision obtained with glasses. If the vision is brought up to 20/40 he should have the 6% disability award, plus the 50% disability for the cataract.

The reason for this may be presented to the commission in explanation of what the man has lost, and what he has left. First, if he does not use the lens for this eye, he has lost a large portion of his useful vision. Having lost the power of accommodation because of the removal of the lens, he has also lost the power of binocular vision.

He retains to a large degree his field of vision on the side of the operated eye which is of much value in avoiding accidents, collisions, etc. He retains what Fuchs' calls "A reserve for the future" which is of much value should the originally uninjured eye be destroyed.

The fifth question asked of us was with regard to double vision. The committee of our Society submitted an interesting and expressive report. The report to the commission is as follows:

"The fact of double vision does not warrant granting the total loss of an eye, as there is not loss of an eye but the loss of binocular single vision, which in most cases can be restored either by operation or the wearing of prisms. In many cases the injured very soon learned to ignore the double vision. The question then to decide is,

What is the relative loss between binocular single vision and single ocular vision? They have the use of both eyes, but only one eye at a time. Therefore, aside from the annoyance, nuisance and poor cosmetic appearance of a blinder being alternately used over the eyes, what would be the interference with their earning capacity?

"Many persons, as for instance jewelers, stenographers, machinists and other industrial trades requiring very accurate vision, would certainly have greater disturbance in performing their work with one eye than would unskilled labor, or most agents of corporations, or officers of banks, life insurance companies, etc. Therefore, it seems as tho our state law should be changed so that the commission can take into consideration the interference of earning capacity in a particular employment. Under existing conditions we believe no percentage table applicable or just, but as the percentage of disability is the information desired, we recommend 25% disability for total loss of vision in one eye in the uncorrectable cases. In cases that are corrected, 12½%."

The Society as a whole cut these percentage figures to 20 and 10.

With regard to the additional question as to disability in case of traumatic cataract when the man refuses operation, the Society did not express a united opinion and will be pleased to know how this question is handled by the Chicago Ophthalmological Society.

In conclusion the Milwaukee table is based upon a 3% loss of vision for every 10 foot loss of ability to read the letters of the Snellen chart up to 20/350 which we allow to be industrial blindness. We do not follow the report of the Committee of the Chicago Ophthalmological Society which appeared in the *Ophthalmic Record* of January, 1917, as we feared the report on the whole would not be understood by the Wisconsin Industrial Commission.

The vision of both eyes does mean much in the estimation of visual disability. But if no regard is made of the vision of either eye before injury settlement can hardly be based upon this after injury. It is difficult enough when estimation deals with the one injured eye alone. No complaint has impressed the commission as to loss of stereoscopic vision. This faculty is restored upon effort. Moreover, some of us are not so sure that stereoscopic vision is entirely dependent upon two equally good seeing eyes.

Human interest, plus the statement of the man and testimony of oculists, tends to give more compensation rather than less for disfiguring injury with bad cosmetic effect. We believe compensation should vary with character of employment. This is not yet written in the Wisconsin law. This does not limit our report as to visual disability. Simplicity in the table should be our watchword.

20/ 20=	100%	vision and	no loss of vision
20/ 30=	97%	vision and	3% loss of vision
20/ 40=	94%	vision and	6% loss of vision
20/ 50=	91%	vision and	9% loss of vision
20/ 60=	88%	vision and	12% loss of vision
20/ 70=	85%	vision and	15% loss of vision
20/ 80=	82%	vision and	18% loss of vision
20/ 90=	79%	vision and	21% loss of vision
20/100=	76%	vision and	24% loss of vision
20/110=	73%	vision and	27% loss of vision
20/120=	70%	vision and	30% loss of vision
20/140=	64%	vision and	36% loss of vision
20/130=	67%	vision and	33% loss of vision
20/150=	61%	vision and	39% loss of vision
20/160=	58%	vision and	42% loss of vision
20/170=	55%	vision and	45% loss of vision
20/180=	52%	vision and	48% loss of vision
20/190=	49%	vision and	51% loss of vision
20/200=	46%	vision and	54% loss of vision
20/210=	43%	vision and	57% loss of vision
20/220=	40%	vision and	60% loss of vision
20/230=	37%	vision and	63% loss of vision
20/240=	34%	vision and	66% loss of vision
20/250=	31%	vision and	69% loss of vision
20/260=	28%	vision and	72% loss of vision
20/270=	25%	vision and	75% loss of vision
20/280=	22%	vision and	78% loss of vision
20/300=	19%	vision and	81% loss of vision
20/310=	16%	vision and	84% loss of vision
20/320=	10%	vision and	90% loss of vision
20/330=	7%	vision and	93% loss of vision
20/340=	4%	vision and	96% loss of vision
20/350=	1%	vision and	99% loss of vision

NOTES, CASES AND INSTRUMENTS

RETINAL EMBOLISM

CLARENCE A. VEASEY, M. D.

SPOKANE, WASHINGTON

Embolism of the superior branch of the central retinal artery, the lower half of the visual field remaining permanently abolished.—O. R., a married female, aged about thirty years, consulted me September 8th, 1909. She stated that four days before she had discovered upon waking in the morning that the vision of the left eye was abolished. Vision of R. equaled 5/5 and the patient read easily Jaeger 1. Vision of L. equalled 5/22, the patient being unable to read any Jaeger type. The pupils of both eyes responded to all tests. The media were perfectly clear, but the disc of R. was exceedingly pale in the upper half on the nasal side and the upper two-thirds on the temporal side. There was marked loss of translucency in the disc, the physiologic cup being apparently covered with a thin more or less opaque veil-like substance at about the level of the disc itself. All of the arterial branches arising from the superior branch of the central retinal artery were found dwindled to mere threads, there being no discernible blood current in them. The veins also appeared to be not more than one-third their normal size and the upper half of the retina supplied by these vessels was at that time exceedingly opaque. There were no hemorrhages, and no cherry red spot in the macula was observed. The inferior branch of the central retinal artery and all its branches were quite normal. The lower half of the visual field was entirely abolished, the fixation point itself remaining in the preserved portion.

Deep massage, the employment of nitroglycerin and the iodides caused the restoration of normal vision in five days' time. The retinal edema, however, did not begin to disappear until some days later. There were no lines along the blood vessels indicative of perivasculitis. There was a small artery coming from the physiologic cup and passing out to the macular region just as the superior branches and which evidently came off from the superior. No coarse macular changes took place.

Examination of the urine was negative, but there was a marked systolic heart murmur, more noticeable in the neighborhood of the apex. For more than one year prior to this attack the

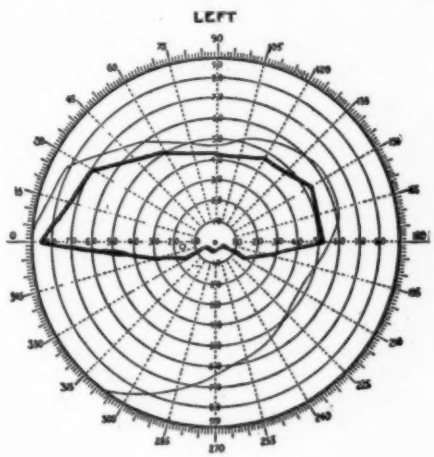


Fig. 1.

patient had observed periods of obscuration of vision and what she called "black spots" (probably arterial spasm), these attacks lasting only a few minutes at a time. Two months later the patient's visual acuity was 5/5 in each eye and the patient could read Jaeger 1. The lower half of the visual field remained entirely abolished.

HIGH MYOPIC ASTIGMATISM

CLARA A. MARCH, M. D.

BUFFALO, N. Y.

The following case seems to be worthy of mention because of the unusually high degree of compound myopic astigmatism. The patient, Miss M. A., a nurse, came to my office August 9, 1919, having been referred to me by Dr. Bennett. She complained of headache in the frontal region, usually

in the morning. The headaches had been continuous for the last three weeks. They were frequently accompanied by nausea and vomiting. Vision: R. 3/200, L. 5/200. Under cycloplegia with homatropin the skiascopy was R. —27 ⌒ —13; L. —27 ⌒ —12. The media were clear and the fundi were normal.

The right —13. sph. ⌒ —14. cyl. axis 7½° V. = 20/50.

Left —12 sph. ⌒ —15. cyl. axis 157½° V. = 20/40.

August 14, the patient returned and I prescribed:

Right —12 sph. ⌒ —12. cyl. axis 15° V. = 20/50.

Left —12 sph. ⌒ —14. cyl. axis 165° V. = 20/40.

With plus 3. added for near work, the patient read No. 5 Jaeger at 13 inches. She said she never saw so well before.

CONGENITAL APHAKIA

P. B. Wing, M.D., F. A. C. S.

SAN DIEGO, CALIFORNIA

In 1915, while practicing in Tacoma, Washington, I was asked by one of the obstetricians to examine the eyes of a new-born girl baby at one of the local hospitals.

I found every appearance of complete double congenital cataract, the pupils were uniformly gray; otherwise the eyes were apparently normal. Contrary to the usual history of such cases the child was well nourished, strong, of good size and showing no signs of poor development, low vitality and low mentality that I have so often seen in such cases.

When the child was about six months old I was requested to operate. The patient was prepared for the operation by my assistant, Dr. J. H. Spencer, the pupil was dilated and a general anesthetic given and I proceeded to open what I supposed to be the anterior capsule; much to my surprise I found only a thin membrane.

The knife needle was inserted in the usual manner to do the ordinary first needling and when withdrawn a small black opening remained. There was no reaction and a few days later I operated on the other eye, this time, however, I dilated the pupil as before and with the knife needle split the capsule with a large inverted V-shaped incision; there was no lens matter, nothing but the capsule like membrane.

In a few days the same operation was done on the first eye. Large black pupils at once resulted. No reaction from the operation, no flakes of lens matter appeared in the pupil or in the anterior chamber.

The child is now four years of age, a well-developed, intelligent baby girl, pupils are round and clear, fundus normal, and with a plus 7 D. lens she quickly picks up a pin from the floor and sees objects like a nickle, a pencil, or penknife at a distance of twenty feet. There is a slight convergence which may have to be corrected later by an operation. I have been unable to find a similar case reported; most authors do not mention it, one or two state that such cases are on record, but doubt the authenticity of them.

I beg to be excused for not making a more accurate diagnosis, but as I did not dilate the pupil or give an anesthetic until the time of operation, and as my assistant prepared the patient, I did not examine as carefully as I might have done. The anterior chamber appeared normal in depth and the iris was not tremulous. I am of the opinion, however, all things considered, that my diagnosis would have been the same until the operation cleared it up.

I am certain that the lens was not absorbed after birth as there was no injury during labor, which was normal and easy, also there was no reason to think that absorption took place in utero. It simply was absent.

SOCIETY PROCEEDINGS

NETHERLANDS OPHTHALMOLOGICAL SOCIETY.

FIFTY-FOURTH MEETING, DECEMBER 15, 1918.

DR. C. NICOLAI in the Chair.

Treatment of Corneal Ulcer with Optochin.

H. F. DUBOIS mentioned it is about 5 years since optochin was introduced for hypopyon ulcer. He has been unable to examine all his cases microscopically. His survey includes cases with and without dacryocystitis and can be divided into true serpent ulcer, hypopyon ulcer not serpiginous, abscess of cornea and hypopyon keratitis.

During the last 10 years, he has been able to treat, until discharge, 85 cases, chiefly among a rural population; 54 men and 31 women; 54 of the 85 were between their 50th and 70th years. The youngest was 7, the oldest 90 years. In 37 the cause was a trauma. In 48 (56%) blennorrhea of the lacrimal sac was present; 51 were typical serpent ulcer, of which 36 had a dacryocystitis; nonserpiginous, 29, of which 12 had dacryocystitis. Two cases were of corneal abscess and 3 were hypopyon keratitis in the form of keratomycosis; 60 cases were taken into the hospital.

All factors taken together, the conclusion is that hypopyon ulcer does not heal better than without optochin. The results are the same as before the optochin treatment. The first impression that hospital treatment would be less necessary, has proven wrong. Galvanocautery and paracentesis, with optochin treatment are less necessary. It shows a better action in the cases with dacryocystitis, than in the cases without affection of the lacrimal sac. Instituted early, optochin treatment is not able to stop further extension of the ulcer.

In the beginning optochin was used in a 1% salve, 3 to 6 daily applications in the conjunctival sac, later as drops in a 2% solution every two hours. Dubois learned that one cannot be too careful in the appreciation of a new therapeutic measure, and should not take the general impression of each separate case, but must compare two equal unselected series of cases, in one of which the measure is used, in the other not.

DISCUSSION. Van der Hoeve was sorry that no bacteriologic examination had been made, as the value of these otherwise important statistics rises or falls with the more or less frequent presence of the pneumococci and other organisms. He asked an explanation for the great number of cases in which Breda mentions the very changing course of the disease and the changing effect of the optochin treatment. He uses optochin in every cataract operation before extraction, pneumococci being present or absent.

Snellen considered that the favorable effect in the cases with dacryocystitis, demonstrates a favorable influence on the pneumococci; he spoke of the many cases of hypopyon ulcer where pneumococci are absent. He saw especially a favorable influence in beginning cases. He could not say much of the anesthesia and considers that mydriatics have a less favorable influence.

Van Romunde stated that the simultaneous use of optochin and atropin produces an undesirable chemical reaction, which makes the success of the application illusory.

Tresling had good results with pure pneumococcic ulcers, no results with more serious cases, and pointed out the necessity of having fresh solutions. He is in favor of its preventive use in case of operations.

Weve spoke about the quick poisoning of the pneumococci and the value of touching the ulcer with a strong concentration and after that instillations of weaker solutions. Wessely's treatment of these cases should be mentioned.

Nicolai is still satisfied with zinc salicylat, with which he touches the ulcer and which he uses as drops, and without bandage. He does not see any benefit in the preventive use.

Van Der Hoeve would not give up the preventive application and mentioned the different local malignancy of the serpent ulcer. Dubois, answering thought that even with the absence of bacteriologic examination a curative action should have appeared.

Von Hippel's Disease: Retinal Angiomatosis.

A. W. MULOCK HOUWER showed a girl, 23 years old, who had received a blow on R. 10 years ago. The eye became blind. In July, 1918, she consulted an oculist as L. saw badly for the last 4 months. Vision was then 1/60 with a much contracted field. The marked indolence of the patient was remarkable. R. was now quiet with shallow anterior chamber, atrophic iris, occluded pupil, normal tension, and absence of light perception.

The anterior part of L. remained normal, some fine and larger opacities were in the vitreous, especially in the upper part. In the retina were two groups of red knobs: one up and peripheral, one temporal and pheripheral. Strongly dilated vessels, which cannot be distinguished as veins, going toward these knobs. Surrounding the knobs was massive white tissue. Also larger and smaller white spots were seen in the retina, and many clear glistening white points, especially in the region of the yellow spot. At the lower part of the retina was a transparent flat detachment, thru which many glittering spots in the subretinal cavity could be seen. No other changes.

Altho she complained much of headache, neurologically nothing could be found. Careful Roentgen treatment had no success. A very large retinal detachment in the lower half was present, which covered the optic nerve and the lower half of the temporal knobs. Vision had diminished to light perception. Houwer considered von Hippel's opinion, that this condition was due to an angiomatosis, as the most probable.

Thrombosis of Vorticose Vein.

A. W. MULOCK HOUWER presented a case of thrombosis of a vorticose vein. A carbuncle progressed from the forehead into the orbit. Exenteration of the orbit was done to save life, as the eye had become blind and appeared glaucomatous. Pathologico-anatomically the temporal vorticose vein was found thrombosed; its intraocular part was much dilated.

Method for Detection of Malingerers.

A. VAN DE MOER has had an experience of at least 25 years as a military examiner. For some 18 years he has used his method among some 80 ways for detection of one sided diminution of vision or blindness. It is based on the fact that a colored glass conceals the complementary color, when the background is black, red letters on a black background are invisible thru a green glass, and vice versa. It is also known, that red letters on a white background cannot be seen thru a red glass. Green and blue on a white background are never invisible thru green or blue glasses, as von Haselberg mentions.

His method for detecting amblyopia in one eye, when the vision and fixation of that eye rests on this insufficiently appreciated circumstance, that while red letters on a white background become invisible thru a red glass, blue letters on a white background remain visible thru the blue and yellow glasses in the test cases. He writes blue and red letters on white paper. Some experiments can be done with the examinee, where it is indifferent if he closes one eye, because all colored letters remain visible thru blue or yellow glasses. To mislead, black letters are shown thru red glasses. The colored glass is held always before the best eye and the examinee thinks (and this is demonstrated to him, by closing the diseased eye for a moment) that he reads all letters with his sound eye. No glasses are held before the sick eye, so that this can be controlled constantly. Finally a red glass is held before the sound eye and the red letters which are now read must be seen by the alleged weak eye. If the examinee closes this eye the examiner,

(an assistant holds the colored glasses before the sound eye) turns the page with the red and blue letters, which he has in his hands, so that the examinee is unable to determine what he sees with the weak and what with the sound eye.

The advantages of this method are that the weak eye remains uncovered and under control; that a malingerer must be well instructed before being tested; and that the armamentarium consists only of 3 glasses, red, blue, yellow, and a red-blue pencil.

Discussion. Nicolai objected to the writing every time of the letters, which must impair the exactness of the determination of vision.

Van de Moer thought that less suspicion of the examinee is excited. During the demonstration Roelofs pointed out how the patient without closing one eye can become enlightened as to the question with which eye he sees certain letters.

Pupillary Reaction in Complementary Light.

H. Weve related Behr's hypothesis of 1913; the nasal half of the retina stimulated produces only a direct pupillary reaction, while the response of the temporal half to the light stimulus is only indirect or consensual pupillary narrowing. This would be explained by a double complete crossing of the united pupillomotor fibres in each tract before reaching the nucleus of the sphincter pupillae. This did not concern the foveal part. He must suppose that the temporal and the nasal pupillomotor receive stimuli and are in relation with both nuclear zones. Behr did not consider, as did Hess, the first appearing then quickly decreasing contraction; but the pupillary width, to a certain extent, could be considered constant. It was not impossible that other reflex tracts were involved and a control investigation of Behr's observations was needed.

Behr's method could not be exactly followed, and the indirect reaction can only be studied in cases of one sided amaurosis with entirely normal pupillary reflex paths, with the other eye perfectly normal. This material is very scarce, as appears from Behr's cases, half of which are useless.

Weve sought a method wherewith he could measure the direct and indirect reactions in perfectly normal persons at the same time. Sachs and Hess have demonstrated that the pupillomotor action of rays of different wave-length is proportionate to the impression of brightness of these rays, and it is a fact that fovea and periphery of retina show the same adaptive symptoms with regard to the pupillomotor function as to the visual functions. Hence we may assume that the same retinal elements, which we consider as excited by the light stimulus, also act as exciting the pupil reflexes. Retinal elements, which are chiefly sensitive for light of large wave-length, are scarcely excited by light of small wave-length. Considering these facts, Weve could excite, alternatingly, after some changes of the binocular corneal microscope, the temporal and nasal halves of the retina of one eye, 20° from the fixation point and 8° above the horizontal meridian, with light of small wave-length (blue-green 445 to 560$\mu\mu$), while both eyes were illuminated with spectral-red (600-800$\mu\mu$) in entirely the same way.

The 24 eyes of 12 normal persons were excited during half an hour alternately temporally and nasally, with the light of small wave-length and a series of measurements of both pupils were made. Continuous small oscillations of measurements of both pupils were found in all. In 4 during the examination, a distinct regular enlargement of both pupils was seen. In a fifth case it was only slight, and in a sixth, one eye only enlarged. It already possessed "physiologically" a somewhat enlarged pupil. This shows that it is not allowable to draw conclusions from one observation, as Behr did. The observations must succeed each other quickly. Considering the dubious cases as "even" 7 times the "direct" late reaction was greater than the "indirect" and once the reverse. In 16 cases the direct was like the indirect. Parallelism between direct and in-

direct reactions for both retinal halves was found, in sharp contrast with what Behr thought he found in one sided amaurosis. The hypothesis of Behr can be considered hereby refuted.

Essence and Treatment of Scrofulous Eye Inflammations.

L. K. WOLFF considers scrofulosis to be a particular form of tuberculosis of the lymph glands; mostly caused by the human form of the bacillus, sometimes by the bovine. The glands of neck and head are mostly affected, sometimes the axillary glands and those above and below the clavicle, rarely the inguinal glands. It would seem as if the glands in the thorax are not affected seriously. Changes in the lungs, demonstrable with percussion and auscultation, are very rare. (W. never found any.) Von Pirquet's reaction has taught that if we find these eye inflammations even without any other scrofulous signs, tuberculosis is present. This reaction is positive in 90 to 100%. In chronic infective diseases we know that immunity and hypersensibility reactions can be found together; that these reactions locally can be bound to determined organs or parts of organs; and that these reactions especially can appear where formerly such a disease process was located, but which became cured. If this knowledge is used in regard to phlyctenular inflammation then we must accept, that earlier in the life of the patient a tuberculous process must have been present, which has become cured thru the natural defensive forces of the organism. This eye has now become hypersensitive toward the tuberculous poison. We have only to accept that now and then tuberculous poisons become mobilized from out the tuberculous lymph glands. This will happen especially, when the outward circumstances are unfavorable. Schreiber has found in 25% of more than 200 cases of phlyctenular inflammation tuberculous foci (or the scars) in the retina or choroid. Wolff thinks rather that the phlyctenules are produced by dead bacilli or poisons, considering the transient process and the quick cure, and also those after tuberculin instillations.

Staphylococci can secondarily impair the patient's condition. We must therefore take these in consideration as regards the treatment. We can influence the process in two ways: by removal of the tuberculous foci, from which the poisons emanate, and thru lessening the tuberculin sensitivity of the eye. The last way has been tried —the tuberculin treatment. With the exception of rare communications in the literature of favorable results, the results have not been very good. Wolff has not seen any results from it. Surgical removal of tuberculous foci gives in many instances of scrofulosis good results.

Roentgen rays have also a good effect on these glands. Fourteen patients have been rayed, who suffered with repeated recurrences. One patient died. In 3 cases the result was not good. One of these had in one year one small phlyctenule and a recurring lymph node. The second patient went somewhere else. The third remained half a year without complaint after raying of the cervical nodes; but this was followed by another phlyctenular period. Cervical nodes can hardly be palpated, but the x-ray picture showed tuberculosis of the hilus glands. Raying of these gave freedom from phlyctenules for at least 4 months. In the other cases raying of the neck-glands had proven sufficient.

Raying took place every three weeks; with filtration by an aluminum filter and removal of the secondary rays with felt. No more than 4 H. was given as a dose. It may be necessary to repeat the series of rayings after a year. No bad results; except sometimes the patient had a dry mouth and some pain in the neck, sometimes the neck became a little thick and red. A few times there appeared a general reaction, fever, which soon abated. Once a phlyctenule appeared after the raying. Some were also generally benefited.

Besides the raying of the tuberculous glands the ocular complications must be treated. A 5% salve of flu-

oresceinas argenti (a red powder, which dissolved in distilled water, directly kills staphylococci) in white vaselin was applied every hour in the conjunctiva. It is painless and gave in some cases a very good result. It is also advisable for obstinate blepharitis. Of the 5 cases of benign ocular tuberculosis, 4 did not recur after raying, altho the process itself does not seem influenced in contrast with the phlyctenular inflammation. Wolff found that careful raying with not more than 1.5 H. in the 3 weeks and filtration thru 5 mm. aluminum does not harm the eye.

DISCUSSION. Weve had good results with the arc-light in scleritis cases; the sittings are short and are cheap.

Wibaut asked if a local connection between phlyctenules and cervical lymph nodes is possible.

De Haas mentioned the good influence on the eye condition by the treatment of the scrofulous skin affections.

Roelofs asked why lymph nodes and not lung tuberculosis leads to eye inflammation, and pointed out the great importance of uncleanliness.

Mulock Houwer often saw among recruits scars of apparent tuberculous choroiditis.

Nicolai asked why bacterial poisons can give now insensibility, then again produce recurrences of phlyctenules.

Wolff had no personal experience with the arc-light; however, arc-light only enhances the general resistance, X-rays remove the tuberculosis focus and act deeper. He does not consider the skin efflorescences in the same line with the tuberculosis of the lymph nodes. He is unable to explain the reverse action of anaphylaxis and immunity. A local connection between eye affection and lymph node tuberculosis is improbable, because they did not appear always simultaneously.

Dr. Van Ree, who treated the patients, used very hard rays thru a filter of 1.5 mm. aluminum, a layer of leather, and sea-weed against the secondary rays; he rayed on both sides behind the angle of the lower jaw. In about 10 minutes 4 Holzknecht were given, with the direct raying of the eye 1.5 H. were given.

Intraocular Pressure with Ophthalmic Herpes.

G. TEN DOESSCHATE treated a man, 52 years old, who had suffered with scrofulosis and gonorrhea,. who fell from his horse 7 years ago and was wounded on the right side of his nose and forehead. He always saw well (was a sharp-shooter), and received 4 years ago spectacles with both glasses the same. He suffers now with tuberculosis of the lungs and foot. On August 18 he had pain surrounding R. On August 20 he came under treatment for herpes zoster frontalis. The blebs on the forehead were hemorrhagic with very severe pains. On August 28 the eye began to protrude, the tension increased to 60 or 70 mm. Hg. and the pupil became wide. V. R. zero. L. with 0.75=7/6. The cornea was insensible and dull. Pilocarpin and eserin improved the tension only slightly (to 55 mm). As the exophthalmus was considered the cause of the rise of tension a sclero-corneal trephining was done, with the hope that a depletion of the aqueous humor thru the wound would take place until the exophthalmus would be reduced to normal. The tension became low, vision remained zero and the protrusion continued.

A few days later the eye was hard again, then the exophthalmus began to decrease, and the tension fell to normal, and even subnormal. The dull cornea became clear, the disc visible, perhaps slightly pale, but without excavation. The vision increased to 7/50. The field remained strongly contracted (chiefly the temporal part remained). A higher temperature was never found with the exophthalmus, and during the first days of the herpes eruption the temperature was not observed higher than 37.9° C. Only after 7 weeks the beginning of slight iridic symptoms was observed, which yielded to atropin. Sweating was now less on the right side of the head and a slight ptosis was present.

It is probable that the changes in ocular tension which originate thru trigeminus irritation depend on the sympathetic fibers, which are in connection with the first branch of the fifth nerve, and this would explain the changes of ocular pressure which are found with herpes zoster and which would then depend chiefly on disease of the sympathetic. The cases of herpes zoster frontalis, where hypotony is found, can be explained by supposing a sympathetic paralysis. In another case, which Dubois has described (1912) glaucoma was also found with exophthalmus, so that the speaker considered this abnormal position the cause for the glaucoma, as both arise and disappear pari passu.

The digital tonometry is here inaccurate, which may explain why these varieties of tension have been described so little. The hemorrhagic herpes vesicles point to an important injury of the vascular walls or vasomotors, which could produce an edema of the orbital contents.

The intention was to demonstrate that there could exist a close causal connection between herpes and glaucoma, and that the connection should not be looked for in a general morbid condition, as fever, but of more local nature.

Discussion. Verwey thought that Rochat had remonstrated that irritation of the sympathetic had produced rise of intraocular tension.

Ten Doesschate stated that this rise as found by Rochat is quickly followed by a lowering, and that this last is only observed in men.

Mulock Houwer saw a herpes zoster following a periodontitis, which also produced an exophthalmus, which he thought due to the collateral edema. The tension was normal.

Complete Homonymous Hemianopsia in the Puerperium.

H. Weve described this condition, which supports Endelman's opinion. It is connected with eclampsia; and shows with certainty the existence of a vertical dividing line thru the fixation point, with a very high, probably cortical, impediment of the optical paths. The determination of the localization was the only focal symptom; lues could be excluded; Wassermann negative, both blood and spinal fluid; antiluetic treatment without result; normal sella turcica; the phenomena remained the same since the beginning, 12 months before.

2. Hemikinetic pupil reaction was surely absent.

3. No atrophy of the optic nerves.

4. The sudden beginning during the puerperium and the same course as in the described 17 cases points to the same cause.

Consideration leads to the hypothesis that on the basis of "autointoxication" a vascular spasm originates, with or without secondary thrombosis. The observation is inconsistent with the double representation of the fovea.

In the nontraumatic "peace cases" of homonymous hemianopsia with high interruption, a central remaining field was always found; while in the traumatic "war cases" oftener complete hemianopsia has been observed, which may be due to a particular vascularization of the posterior pole and in the invulnerability of the region; which we have to learn to recognize as the probable projection of the fovea, especially thru traumatic homonymous central scotoma.

Discussion. Verwey, to his amazement, did not hear the theory of von Monakow mentioned.

Wibaut and Nicolai do not like to reject the theory of Wilbrand and Saenger entirely; altho the supposition of an individual difference for explanation of the presence of a sharp dividing line is not very acceptable.

Weve considers the rejection of von Monakow's theory by Brouwer sufficient, and it cannot keep its ground against the great number of known macular hemianopic scotomata. The theory of Wilbrand and Saenger, already improbable thru the mentioned auxiliary hypothesis, depends only on the findings of Ramon y Cajal of fiber division in cats, which is absent in dogs and rabbits.

Late Infection after Trephining.

H. F. DUBOIS had observed his patient since 1913. L. was trephined on August 5, 1916, under cocain anesthesia, the iris did not prolapse. Only next morning a very tiny prolapse existed under the conjunctiva, which was excised, after which the pupil became round again. On August 14, R. was trephined. Iris prolapsed and was cut off. In both eyes a slight iritis appeared, which healed in a few days with homatropin. Patient came on January 19, 1918, with pain in R. since a few days. Tension normal. Deep pericorneal injection and photophobia, ciliary body painful on pressure. Iritis with slightly cloudy aqueous; an iridocyclitis one year and a half after trephining. Scopolamin 0.2% 3 t. d., and 3 grammes aspirin daily, dark spectacles. Next morning the conjunctiva over the trephine opening was slightly touched with the galvanocautery. On January 23 patient could return home. Vision and field have not suffered; the condition remained unchanged the following 8 months.

Dubois considers application of the galvanocautery of high value.

DISCUSSION. Tresling and Nicolai doubt somewhat the diagnosis of "late infection" on account of the benign character, and the absence of a perceptible continuity between scar and inflammation.

Mulock Houwer saw, 10 years after a trauma which had produced a filtrating scar at the corneoscleral junction, a purulent inflammation with hypopyon in the vesicle and in the anterior chamber. After opening and cauterization quick recovery.

Dubois saw the first redness at the place of the scar, and supposes therefore a connection. It was this time not a purulent but a more mild inflammation.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

May 12, 1919, Dr. Heman H. Brown, in the Chair.

Visual Disability and Compensation.

DR. SAMUEL G. HIGGINS, of Milwaukee, Wisconsin, (by invitation) presented "The Report of the Milwaukee Oto-Ophthalmological Society on Visual Disability from Eye Injury and Compensation to be Allowed by the Wisconsin Industrial Commission."

This report had been requested by the Industrial Commission of Wisconsin as they wished to establish an equitable settlement according to the enacted law for compensation for eye injury. Reference to other tables and attempts to apply a working basis for compensation was made in the paper to show that they were of the same idea in the fundamental estimation of vision. This paper is published in full, p. 813.

DISCUSSION. MAJOR HARRY S. GRADLE told of the "Compensation Table as Reported to the Chicago Ophthalmological Society" and published in the American Journal of Ophthalmology in July, 1918, p. 457.

The idea of the committee appointed to investigate the matter was to give recompense to the injured man based upon his earning capacity after his recovery from the injury. So many factors entered into the matter that no particular table could be prepared that would cover all cases. They tried to simplify and reduce to an arithmetic basis all the factors upon which the degree of the ocular efficiency of the injured rested, and divided all the results of injuries into ten main heads. He reviewed these different heads and stated that the committee did not attempt to say what compensation should be paid. It was not their rôle as ophthalmologists, because a man earning ten to fifteen dollars a week was not entitled to the same amount as the man earning thirty to forty dollars a week. The amount should be decided by the legislature and was usually based upon the weekly salary. They agreed with Dr. Higgins that 20/40 did not by any means represent a loss of 50 per cent vision, but they could not determine what it represented and had to accept it as 50 per cent loss until some other term was determined. The resultant vision must be taken and the vision of the other eye because compensation was based upon the ocular efficiency of

the man, not upon the injury and what it was, but what the man could do with his eyes after recovery. In the case of a man who did fine work, it was necessary to find out how much depth perception he had and how much he had lost. In the human interest and cosmetic result, if the injury was disfiguring they were entitled to a certain amount of compensation for that alone, no matter what the injury to the eyeball might have been.

As to when the examination should be made—time was a factor; the man would probably think the vision was at the worst stage two or three days after the injury, while if it was something that cleared up slowly the employer would want it taken as late as possible, so they decided that at least two months should elapse between the time of the injury and the time upon which the record of vision was based. They believed this would give a fair idea of the resulting vision.

In the second class of cases with impairment of both eyes they placed the total compensation as three times that for one eye.

The committee still believed that the compensation must be based upon some such data as was contained in the table which they had submitted, altho it was not presented with any idea of its being accepted as final. The committee desired opinions upon that type of table and hoped that eventually there might be some unanimity of opinion among the ophthalmologists as to what was due for ocular injuries. There should be some definite idea so that a lay board might sit down and figure up just what a certain type of injury was entitled to. That would be the only way in which justice could be done to the employer and the employee. There was no table at present that could possibly be made to cover every case and there must be some method of taking into account all the things that represented the ocular efficiency of the injured.

Discussion. Dr. Frank Allport said that he had listened to the argument of Dr. Gradle and also to that of Dr. Higgins in which they advocated the conclusion of the committee of the Chicago Ophthalmological Society and Barnes-Chapman Compensation Table, adopted in Milwaukee. Both of these tables contained many meritorious features, but they were both too complicated, too long, too involved and too complex to be understood by laymen and by many oculists. Compensation tables would have to be framed in such a way as to appeal to the average mind of the average industrial commissioner, lawyer and accident company. These men knew nothing about involved ophthalmologic subjects. What they wanted was something primer-like in its simplicity, and fair and honorable to all parties concerned in such matters. If a table of this nature could be devised and adopted, it would satisfy everybody and give litigation procedures at least some foundation upon which to go in cases where eyes had been injured. It could be taken as a foregone conclusion that if industrial commissions, lawyers and accident insurance companies were requested to adopt complicated recommendations, they would never adopt them at all and things would go on in their present unsatisfactory and chaotic condition. Both the recommendations suggested by Dr. Gradle and Dr. Higgins involved quite a number of points frequently present in cases of visual losses. He referred to progressive optic atrophy, high power convex lenses after cataract extraction, various forms of intraocular diseases, excessive lacrimation, etc. These were all important features and would have to be frequently taken into consideration, but most of them were matters that would have to be settled by expert medical testimony, and were not susceptible of being adjusted by rules or by compensation tables. He, therefore, thought it would be wise not even to mention matters of this kind at the present time because they only complicated the situation and rendered it more improbable that we should ever make a beginning in settling these complex issues. His own idea was for us to make a beginning with the hope that other things would follow. The most important point that came up in

settling litigation, involving visual losses, was as to the amount of visual loss of one eye. He therefore felt that if we could arrive at some reasonably fair agreement concerning a compensation table for matters of this kind, it would be a great step in advance and after this one step had been taken, other steps would follow.

There seemed to be, at the present time, a general desire on the part of all parties concerned in litigation of this kind to adopt some simple table as a working basis to go on. He believed that if a table was suggested and endorsed by oculists it would find a ready adoption by industrial commissions, lawyers, insurance companies, etc., but we must never forget that a table of this kind must be absolutely simple, easy to understand and fair to both plaintiff and defendant. Unless a table of this kind was endorsed by oculists, it would never be adopted in litigation.

The table that he recommended was one suggested by Drs. Prince, Penick and Hagler of Springfield, Illinois. He had made one alteration in the Springfield table, and that was to endeavor to settle the question as to what constituted industrial blindness. The Springfield table indefinitely specified it as "nil," but he did not think that this was sufficient. He thought we should try, as he had said before, to settle what should be estimated as industrial blindness. Personally, he felt that if a man could not see the 200 test type at more than five feet he should be regarded as industrially blind—in other words, 5/200 should indicate industrial blindness. Of course, this was a point that might be argued pro and con—a man who had this amount of vision was, of course, not blind in the strict sense of the word, but he was certainly industrially blind, and could no longer do ordinary work in an ordinary way. He had been told by some prominent accident insurance men that they would endorse this view and personally he felt it was most generous and liberal of them to be willing to accept 5/200 as industrial blindness. He made, therefore, this important change in, what he called, the Springfield table—otherwise the matter was left just as devised by the Springfield doctors. He presented the table herewith:

Industrial blindness or 5/200 entitles an applicant to 100 weeks of compensation.

10/200 entitles an applicant to 75 weeks of compensation.

20/200 entitles an applicant to 50 weeks of compensation.

20/160 entitles an applicant to 40 weeks of compensation.

20/140 entitles an applicant to 35 weeks of compensation.

20/120 entitles an applicant to 30 weeks of compensation.

20/100 entitles an applicant to 25 weeks of compensation.

20/80 entitles an applicant to 20 weeks of compensation.

20/60 entitles an applicant to 15 weeks of compensation.

20/50 entitles an applicant to 10 weeks of compensation.

20/40 entitles an applicant to 5 weeks of compensation.

20/30 entitles an applicant to 2 weeks of compensation.

20/20 entitles an applicant to nothing.

In accordance with the law of the State of Illinois, a man who was industrially blind was entitled to 100 weeks of compensation for industrial blindness in one eye. This was a matter that we had nothing to do with; we could not change it because it was a part of the law of the state. Of course, other states had different laws, but they, at the present time, were working under the law of the State of Illinois. If, then, this point was settled and if they could agree that 5/200 constituted industrial blindness, the rest of the problem seemed to be perfectly easy—all they had to do was to use the Snellen test type and grade down the number of weeks of compensation until normal vision was reached, which, of course, entitled a person to no compensation whatever. This grading down of the weeks of compensation should be done as gradually as possible. He thought the Springfield table had done this fairly and about as accurately as it could be done.

There was one thing to be noted, that, inasmuch as the law of the State of Illinois entitled a person to 100 weeks of compensation for industrial blindness in one eye, it made it easy and possible for the estimation of the loss of vision by percentages; that is, one could call the number of weeks in the last column either weeks or percentage. For instance, a person who was industrially blind was entitled to 100 weeks of compensation and had 100 per cent loss of vision. A person whose vision was 10/200 was entitled to 75 weeks of compensation and had a loss of 75 per cent of vision. A person whose vision was 20/200 was entitled to 50 weeks of compensation and had a loss of 50 per cent of vision, etc. Of course, we were all familiar with the fact that at the present time we were obliged, in giving testimony, in cases of this kind, to estimate visual losses in accordance with the fractions derived from Snellen test type. For instance, 20/40 of vision at the present time was regarded as one-half loss of vision, and yet we knew perfectly well that a man who had 20/40 vision had not lost one-half of his vision. 20/50 of vision was regarded in our courts as a loss of three-fifths of vision, and yet we knew that a man whose vision was 20/50 had not lost three fifths of his vision, and yet this was the way we were practically obliged to settle cases of this kind.

This was obviously unfair and should not be allowed to continue. He thot there was practically no difference of opinion on this point—the only question was, what should we do to arrive at a conclusion that was fair? It was for this reason that he suggested the Springfield table. Some men imagined they were espousing the cause of the laboring men when they objected to such a small amount of money representing the various degrees of visual loss. This was a matter that we had nothing whatever to do with. This had all been settled by the legislators at Springfield under the Workmen's Compensation Law. Industrial blindness of one eye meant 100 weeks of compensation—no more and no less. He was quite willing to admit that he would not lose one of his eyes for this amount of money, and in a broad humanitarian sense he did not consider that 100 weeks of compensation represented a sufficient amount of money to reward a man for the loss of an eye, but we had nothing to do with that at all. The law could be changed, but until the law was changed, we would have to work under the law of Illinois and not in accordance with our own philanthropic ideas. Some people, in looking over the circulars issued by the various insurance companies, noted that under some kinds of policies a man received $2,500 for the loss of an eye, and under some other policies he received $5,000 for the loss of an eye, etc. That was all true, but one must remember that those circulars were printed to attract customers for high class and expensive insurance. Like most everything else in this world, if one paid a large amount of money for it, one would get a superior article, but one could not get a $75 suit of clothes for $25, and one could not be paid $5,000 for the loss of an eye if the compensation was to be paid under the Workmen's Compensation Act and if the insurance was paid, not by the individual who was injured, but by the man who employed him and by the accident insurance company. So arguments of this kind were worthless and had nothing to do with the case, and yet the speaker heard them indulged in by people frequently who did not understand the situation.

As a beginning, then, of a better and fairer basis and as a start toward introducing something that would enable doctors, industrial commissions, accident insurance companies, etc., to have something that might be used as a kind of working basis to go on, he proposed the adoption of this Springfield table, as modified by him, by the Chicago Ophthalmic Society. He believed that if we could only make a start and adopt this table, it would go a long ways toward assisting litigation and enabling interested parties in arriving at just and equitable

conclusions concerning the subject of visual losses of one eye.

Dr. Frank Brawley felt that there was some justice in what Dr. Allport said about taking one step at a time, but the Springfield table seemed to him to cover such a small portion of the subject that he did not think the Chicago Ophthalmological Society should really accept it formally. As a scientific body they should give it more thought and produce something better. The table presented by Dr. Gradle could be simplified a little, but simply to take one side of the question without considering all the absolutely essential things that came up every time one went to the board, was impossible. It did not take in the various things that made skilled labor—stereoscopic vision and various things of that type. He did not feel that the table the committee presented was so very complicated; it could not all be carried in the mind, but a given case could be classified under its proper heading and then the calculation became very simple. If the Industrial Commission and the legislature would not accept anything but the Springfield table, perhaps it should be adopted. In testing for depth vision a very simple plan had been worked out at the medical research laboratory where he was, something much more simple than the Hering test. Two sticks were used and placed at different distances apart and the subject told which was the nearer. This was fairer than the Hering test. The thing to be determined was not what an injured man had lost in vision but what he had lost in earning power.

Dr. G. Henry Mundt liked Dr. Higgins' report; it seemed to be simple, he understood it, and he believed it was a table that they could really begin with. He agreed with Dr. Allport that it was only with considerable difficulty that the report of Dr. Gradle could be understood. He thought that instead of Dr. Allport's motion regarding the Springfield table, it would be a good thing for the society to ask the committee, if it still existed, to bring in a table which might have a little better starting basis. The table should be based upon the percentage basis. They need not pay any attention to the Illinois law other than the fact that anything that they accepted should conform to that law.

In his opinion, the time to determine vision should be when the injury had been completely recovered from.

Dr. Oliver Tydings thought a third thing should be taken into consideration; they had heard about the insurance companies and the commission, but he thought the taxpayer had not been represented as against either of these. Whenever industrial damage was taken into consideration they, as a progressive, civilized body, must assume certain responsibilities. This would afford a working basis for the insurance companies, the commission, and the people. Many people were dependent upon the state for a livelihood who had lost their earning ability thru industrial accident. The community, as a whole, bore a larger percentage than either the insurance companies or the employers of labor. The community had borne it all in the past, except the little that could be obtained by long litigation. He felt sure that every employer of labor today, without an exception, would accept the Springfield table, but it did not do justice either to the community as a whole or to labor itself. He hoped with Dr. Gradle and Dr. Brawley that the matter would be deferred until the subject could be intelligently acted upon.

Dr. Samuel G. Higgins thanked the society for the privilege of coming down to participate in the meeting and thought that among the things that had been arrived at was the fact that a complicated table could not be understood by any lay board. Therefore, he assumed that the society could well pass upon a point which they determined to be industrial blindness, and he would report to his society that 5/200 was a better standard than the 20/350 which they thought would be practical.

He also believed the point had been arrived at where they could interpret the Springfield table on a percentage

basis and that they might adopt a table which might be the Springfield or the Milwaukee, and find that in the money paid the amount would be practically the same. A table of this kind might at this time or at any time be given to the courts or to the industrial commission as a working basis, and all other questions must be settled by the opinion of the oculist, and the oculist representing the injured man might express his opinion. An expert called in by the commission might express his opinion, and if the employer wanted still another man, that opinion might be recorded, as the oculists were united. In other words, science and the three opinions would not differ very much and they could be added and divided by three and the amount really awarded the man would be about the same. He thought the award in many ways was very liberal; in Illinois the award was $12, based upon 100 weeks, and in Wisconsin it was $9.40, based upon 140 weeks; so it was about the same.

In his opinion it would be well for the oculists to have a table of their own, in which they could offer their opinion on a given case. That might enter into the literature and be known to the board to be referred to, but that they should not ask the board to apply it except as deductions were made by some oculist. He considered stereoscopic vision negligible.

He hoped that the very simple matters and very practical questions had shed some light on the subject. He thought the oculists should fight out the question regarding the removal of cataract which resulted from injury.

Dr. Charles C. Clement thought it was impracticable to recommend a single report for the guidance of the Industrial Board and also for the guidance of the oculist. The board should have a simple report which they could work on and there should be another report for the oculist. The Industrial Board would not be able to understand a very complicated report, and simplicity should be the keynote of the report sent to them. He saw no reason why the society should not go ahead and lay the foundation by adopting the Springfield schedule for the guidance of the Industrial Board and then build on top of that as elaborate a report as they pleased for themselves.

Dr. H. H. Brown suggested that it would be well for Dr. Allport's motion to be so modified as to embody the Committee on Compensation Table and let them take up the report upon the Springfield table. He thought the work of the society should be considered and recognition should be made of that committee, as it still existed.

Dr. Frank Allport said that in making this motion he supposed that this committee, represented by Drs. Gradle, Brawley and Woodruff, had handed in their report to the society and had been dismissed. Dr. Allport said he had no desire of producing any embarrassment to this committee, and while he did not regard their report as a satisfactory solution of the subject, he would withdraw his motion and recommend that the matter be reconsidered by the committee, and hoped that they would regard with favor the Springfield table which he had brought to the notice of the society.

He wished to admonish the committee to give up the discussion of abstract and involved problems and to endeavor to bring in a report that could be understood by laymen of average intelligence.

Dr. Robert Blue considered it very essential to know for what purpose the table was to be compiled. Whether for the guidance of the insurance companies, the Industrial Board, or for the estimation of ocular efficiency by oculists. If for the laymen, it would be one thing and if for the oculists it would be another. If it was for the Industrial Board it should be as simple as possible. If for the guidance of the oculist in determining ocular efficiency, an accurate guide for judgment should be sought rather than mathematic simplicity.

ALFRED MURRAY, Sec.

BALTIMORE CITY MEDICAL SOCIETY

OPHTHALMOLOGIC SECTION

MEETING OF OCTOBER 15, 1919

Retinitis Circinata.

DR. HARRY FRIEDENWALD exhibited a case of retinitis circinata which showed marked edema of the retina, with numerous hemorrhages in a circular form about the macula. All physical examinations were negative.

Ptosis Operation.

Dr. Friedenwald read a report of cases of ptosis operated on by the Hess method. In the past most of his ptosis operations had been more or less unsatisfactory. In September he had operated upon two cases of congenital ptosis. The first was in a boy of four years of age, who had had a Beard operation about two years previously, with very disappointing results. But the operation by the Hess method had so far been very gratifying.

The second patient was a girl of four years of age, with congenital ptosis, who was also operated on by the Hess method, and he had been extremely well pleased with the results. He allowed the main sutures to remain in for two weeks. It had produced a fold of integument on the upper lid, but this was only noticed when the patient was looking down.

DISCUSSION: Dr. Theobald spoke of a case of bilateral ptosis, in which he had performed the Gruening operation on the right eye with fair results. On the other eye he has dissected out a longitudinal strip of tarsal cartilage from the inner surface, with suturing of the remaining portions on the conjunctival surface. The results in this eye were much better than in the first one. He had recently heard from the case and the patient was much more satisfied with the last operation.

Plastic Operation on Lids and Face.

CAPT. H. K. FLECKENSTEIN, who is stationed at Fort McHenry, said that most of the cases that he had to deal with were those of loss of tissue and cicatricial contraction. In most cases the scar tissue was dissected and as much removed as possible; and that any patients having old scars were given antitetanic serum several days prior to operation.

Most of the grafts for cicatricial entropion or remodelling of lids was done by free Wolfe grafts. The skin was prepared by cleaning and painting with 3½ per cent iodin. The cicatricial tissues removed, grafts were preferably taken from the upper lid and tension suturing utilized if necessary. The grafts were handled on gauze, not placed in salt solution, but transferred immediately to the area grafted. The threads were prepared in equal parts of wax and vaseline. In case the cilia were destroyed the margin of the brow was used in order to give a margin with hair. Extremely few graftings were lost by this method. He thought that neither the Esser nor the Thiersch grafts were quite as satisfactory, altho the Thiersch grafting may be performed under local anesthesia.

In cases of depression of the orbital wall under the temporal muscles, as much scar tissue as possible is removed. Then a piece of fascia lata is dissected and implanted in the depressed area. Bone or cartilage may be used, but the fascia lata seems to be more satisfactory.

In cases of destroyed conjunctiva, a form of dental composition is molded, and a Thiersch graft is put over the form and placed in position to be grafted, with the suturing of the lids over the form. These grafts usually take very rapidly.

This very interesting paper was discussed by Drs. Witham and Looper.

C. A. CLAPP, Secretary.

American Journal of Ophthalmology

Series 3, Vol. 2, No. 11 November, 1919

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY

EDITORIAL STAFF

ADOLF ALT,
Metropolitan Bldg., St. Louis, Mo.

M. URIBE-TRONCOSO,
143 W. 92nd St., New York City.

MEYER WIENER,
Carleton Bldg., St. Louis, Mo.

CASEY A. WOOD,
7 W. Madison St., Chicago, Ill.

HARRY V. WÜRDEMANN,
Cobb Bldg., Seattle, Washington.

EDWARD JACKSON, Editor,
318 Majestic Bldg., Denver, Colo.

CLARENCE LOEB, *Associate Editor,*
25 E. Washington St., Chicago, Ill.

Original papers and books for review may be sent to any member of the editorial staff Reports of society proceedings, correspondence, and other scientific communications should be addressed to the Editor.

Proof should be corrected and returned within forty-eight hours to the printer. Reprints may be obtained from the printers, Tucker-Kenworthy Co., 501 S. La Salle St., Chicago, Ill., if ordered at the time proofs are returned.

Subscriptions, applications for single copies, communications with reference to advertising or other business, should be addressed to

H. A. FOX, Manager, 7 West Madison St., Chicago, Ill.

ANIMAL EXPERIMENTATION IN OPHTHALMOLOGY

Ophthalmology owes much, directly and indirectly, to animal experimentation, and when properly conducted it is often a fertile source of information. When the ocular organism itself is chosen as the medium of research it is hardly necessary to point out that the feral or domesticated eyes chosen for the purpose should resemble as closely as possible those of man if one is to draw definite conclusions from such investigations.

Even a superficial student of the biology and histopathology of the visual apparatus in the so-called lower animals will soon be convinced that the manifest differences between the tissues and their reactions to morbid influences in the eyes of man, and of such creatures as the dog, mouse, rat, guinea pig, rabbit, frog, etc., make it highly improbable that a certain class of laboratory experiments and investigations can do more than suggest the possibility (in some instances the probability) that like conditions prevail in both. Conclusions drawn from this form of experiment are certainly open to serious doubt so far as their application to human experience is concerned. Indeed the employment for research purposes of animal eyes below the simian orders (and the more closely they approach the tissues of the higher apes the better) can have but little value for scientific conclusions in human pathology.

Altho years of valuable time and the concentrated energies of hundreds of observers have been expended during the past half century in attempts to apply lower animal evidence in human ophthalmology most of it has probably been wasted.

The chief workshop for promiscuous production of this sort has for several decades past been Germany. We all know how often the report of an "Arbeit" proposed by a teacher in some klinik or laboratory, and carried out by indefatigable students with an enthusiasm worthy of a better cause, has filled dreary pages of "Graefe's Archiv" or some other Teutonic journal.

In the course of time, absence of responsibility involved in this kind of research frequently led to an utter disregard of what may well be termed the "rights of animals." If the extent and character of the investigations called for twenty dogs, the question whether the sufferings or loss of eyesight of these highly-developed and sensitive animals justified the sacrifice, hardly formed part of the proposed examination. There was, indeed, always danger, especially in ophthalmic inquiries of an otherwise humane man forgetting his humanity.

We had an outstanding example of that result in the case of a member of the *Ophthalmologische Gesellschaft,* who reported (*Bericht,* 1913) his attempts, *à la* Tantalus, to produce myopia in monkeys. These animals were placed in cages so that they were compelled to look down at food placed near them, their refraction being (from time to time) worked out by skiascopy. This observer noticed an increase in the refraction which amounted in one case, *during seven months,* to 7 diopters, and in another instance to 5 diopters! To his everlasting credit, von Hippel, in the discussion, maintained that the experiments were unjustifiable on account of their extreme cruelty.

Another false position which the lower animal experimenter so often assumes is that all eyes—avian, amphibian, mammalian—are of equal value for his purposes. Of the hundreds of examples that might be quoted from the literature on this subject, a certain well known investigator publishes (but not in the English language) his "contribution to our knowledge of trachoma corpuscles." In the course of the experimentation smears were taken from the eyes of the following animals: the frog, toad, rat, guinea pig, rabbit, dog and ape, and man; and from 60 cases of trachoma, 6 of spring catarrh, 6 of catarrhal conjunctivitis and 4 of purulent conjunctivitis. Only in cases of trachoma, and of these only in 29 out of 160 cases, were the trachoma bodies found, whereas in other specimens were found pseudoinclusions. granulations of the cellular protoplasm resembling the trachoma bodies, but not to be confounded with them. It is no wonder that corresponding variations in the inoculation experiments were noticed in respect to the vernal catarrh and other conjunctivitides!

A dim recognition of the contention that human and lower animal eyes are not necessarily interchangeable in the laboratory sense appears now and then in the writings of investigators themselves. For example, Cords, in his recent studies of *scarlet red* (see that caption in the *American Encyclopedia of Ophthalmology*), admits that one cannot argue, at least so far as this much-vaunted agent is concerned, from the lower animal conjunctiva to the same structure in man.

Roemer (*La Clinique Ophtalm.,* October, 1906) demonstrated that by means of a powerful antipneumococcic serum rabbits can be absolutely immunized against the pneumococcus. And, further, in these immunized rabbits, he has not been able to produce the least inflammatory reaction in the rabbit's cornea. It is true that "serpiginous ulcer cannot be produced in the rabbit; but in apes, which are liable as are men to corneal suppurations, Roemer was able to bring about an immune condition, absolutely refractory to pneumococcic infection of the cornea." As one would expect!

Quite recently one German and one Japanese investigator—both of them lights in the world of Ophthalmology—discovered, after elaborate laboratory experiments on dogs, that ganglion degeneration of the retina and optic nerve atrophy is a common result of thyroid toxemia; and it seemed strange to them and to others that "one notices this sequel so infrequently in man." A study of the canine ocular apparatus might rather have caused remark if the human consequences had been otherwise.

That monkeys, especially the anthropoid apes, constitute expensive material and are difficult to obtain for laboratory observation, is really no argument at all for substituting dogs and guinea pigs; indeed it may well be an *argumentum pro.* There has been,

we believe, too much irresponsible and unscientific experimentation (mostly perpetrated abroad) in the past, and too little attention paid to the regular continuous *clinical* study of human ophthalmic cases in public and private practice.

The objection to the mass of evidence presented to us in reports, especially of lower animal bacteriology and pharmacognosy, is not entirely that it is inhumane but that it is also incompetent, inadequate, and, therefore, unscientific. The results *may* be as stated, but since only careful and prolonged observations made by trained and competent observers of human and anthropoid animals can remove the doubt and clarify the obscurity, why meantime, worry the eyes and nervous system of the dog, the guinea pig, the rat, *et hoc genus omne?*

When, as now proposed, an investigation of eye problems is made on our Simian relatives, the same consideration should be shown as one would exhibit towards a man, a woman or a child. Indeed only properly trained teachers should be permitted to utilize for these purposes such an intelligent, nervous and high-strung animal as a monkey. In any event, however, we hesitate to believe it possible that *any* American, however thoughtless or enthusiastic, would be likely to emulate the exploits of our *Heidelberger Gesellschaft* colleague even to demonstrate the etiology of myopia in apes.

Investigations properly conducted along the lines and in the direction just indicated would have a real value in ophthalmology, and when actuated by adequate motives and surrounded by proper precautions would have the approbation of every well wisher of our specialty. C. A. W.

STUDENT ASSISTANTS

The apprenticeship method has been the forerunner of effective schools in many lines of technical teaching. In the past the best way to get an education in ophthalmology in America was to become an office assistant to one of certain good teachers of ophthalmology. Notable among such teachers were Elkanah Williams of Cincinnati, and John Green of St. Louis. To be a student of one of these men was almost a guarantee of professional success.

Many of these teachers are still living, and their number is increasing. It must be admitted that among those who take office assistants are some who are more intent on extending their practice, beyond the limits of what one man can attend to, than upon becoming efficient teachers of another generation of ophthalmologists. Still to assist one of these men gives a large clinical experience. Reading up the conditions seen and careful methods of work, will give the student the mastery of ophthalmology that he desires, while improving the service he gives to his chief.

It is often difficult for the would-be student assistant to get in touch with the older man who could utilize his services and give the needed instruction; and the busy practitioner who needs an assistant sometimes has great difficulty in finding the one he needs. The best way to indicate needs of this kind has been to place an advertisement in the Journal of the A. M. A., but this could generally carry little information regarding the qualifications possessed by an applicant or those expected of an assistant.

Within the past three months we have had letters from four ophthalmologists appealing to their personal friends to find the kind of assistant they needed; and in the same time we have heard from about double that number of doctors who wished to prepare for ophthalmic practice by service in the office of an ophthalmologist. Unfortunately in most cases the applicants did not fit the particular places offered.

If a larger number of such places and a larger number of applicants could be brought together, doubtless a larger proportion of the seekers would be satisfied.

The plan of individual applications does not lend itself to a full statement

of needs, opportunities, and qualifications. We believe the interests of the oculists of the country would be better served by forming a register of applicants of both kinds, and by comparison of those for help, with those who offer service, there would be a better chance of securing a permanently profitable arrangement for both parties. Such a plan is now being worked out and put in operation. From subscribers to the AMERICAN JOURNAL OF OPHTHALMOLOGY the applications will be received and acted on without charge. To others there will be charged a small fee for registration.

It is not likely that all requests can at once be met with satisfactory assistants or positions; but we believe that this plan offers one more way in which this journal can be of real help to the profession.

E. J.

BOOK NOTICES

Eye, Ear, Nose and **Throat.** CASEY A. WOOD, M. D., D. C. L. Albert H. Andrews, M. D., and George E. Shambaugh, M. D. **Practical Medicine Series,** 1919, Volume III, 12 mo., 384 pages. Illustrated. Chicago. The Yearbook Publishers.

The portion of this volume relating to the eye is edited by Dr. Wood, and comprises 180 pages, including about as much matter as one issue of this journal. It is evident that careful selection of the matter to be included in such a work is of the highest importance, and for this its editor is especially competent. To confine the list of topics to those really important, and treat of them with sufficient fullness to make the book really interesting and valuable is a task requiring the abilities of the veteran editor, and compiler of a great encyclopedia. It has been well performed.

The text is liberally illustrated, including several plates, one of them in colors, that have been used in this journal. Altho the material for this section has been found in journals published in many languages, most of it is drawn from publications in English. This is at it should be, and reflects the large proportion of the literature of ophthalmology that is now appearing in English.

Our readers will recognize many things of which they have read in these pages; but it is a work that can safely be recommended to those not familiar with the general literature of ophthalmology. It is well written and printed, and its size makes it convenient to carry in the coat pocket.

E. J.

Ophthalmological Society of Egypt. Bulletin of 1919, 146 pages.

This bulletin contains the sixteen papers read at the annual meeting of the Society, March 7th, 1919, with the discussions they elicited. Of these papers, five deal with various forms of conjunctivitis, and their effects, four take up various aspects of glaucoma and the Elliot trephining. The other consider sympathetic ophthalmia, autoserum in ocular therapeutics, infected corneal ulcer, a case of congenital defect of vision, and other subjects.

These papers are comparatively brief, practical and interesting. Some of them are illustrated by charts, and contain important tables. All but two are in English and these in French. Arabic has been used only in the inscription.

This Society, founded in 1902, now numbers 71 members. A list of these with the officers, and the business-like minutes of the annual meeting are included in the Bulletin. The absence of a table of contents or good index detracts from its value as a work of reference.

E. J.

Transactions of the Section on Ophthalmology of the American Medical Association, Annual Session, June 9 to 13, 1919. 8vo., 419 pages. Illustrated, Chicago, A. M. A.

The twenty-one scientific papers contained in this volume have been or will be published in the JOURNAL of the American Medical Association, or in the AMERICAN JOURNAL OF OPHTHAL-

MOLOGY; but about one-fourth of its pages are occupied by matter not elsewhere published. This includes discussions often more valuable than the papers that give occasion for them, since the discussion represents the wider experience and judgment of several, as against the experience and judgment of the single writer. The usual reports of committees, lists of members, and officers, and minutes of the session are also given here.

A new departure in the present volume is the reproduction of two colored plates, one of cysticercus, the other showing lens opacities, and the changes in them following the use of radium. In size and interest this volume compares well with its predecessors; and its table of contents and good general index qualify it as a book of reference that each American Ophthalmologist should possess.

E. J.

CORRESPONDENCE

Conservation of Vision

To the Editor: In my chairman's address at the Atlantic City meeting of the American Medical Association I called attention to the fact that the series of pamphlets on the Conservation of Vision, published by the Council on Health and Public Instruction of the American Medical Association, had been of great service to me in spreading the gospel of Conservation of Vision among my patients and friends. Since the publication of my address in the *Journal of the American* Medical Association v. 73, p. 876. I have received so many leters inquiring where these pamphlets may be obtained, that I have suggested to Dr. Simmons that the work of the Council of Health and Public Instruction should be better advertised and that a few lines in the editorial pages with reference to the pamphlets above referred to, might be helpful.

It is possible that many of your readers may not know about the pamphlets, and would be glad to avail themselves of their help, if attention was called to them in your Journal.

Yours very truly,
CASSIUS D. WESCOTT.

Chicago, Illinois.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C. Volunteers are needed in other localities.

DEATHS.

Ambrose Kasson, Bath, New York, aged seventy, died at his home, September first.

Fred P. Lierle, Marshalltown, Iowa, aged forty-seven, died September 10th from pernicious anemia.

Joseph A. Kenefick, New York City, aged fifty-eight, died in Lawrence, Massachusetts, September 10th.

Arthur V. Fray, Chicago, aged fifty-five, died in St. Luke's Hospital, Chicago, September 7th, from carcinoma.

Howard F. Pyfer, Norristown, Pennsylvania, aged forty-seven, died at his home, September 5th, from bronchopneumonia.

Francis M. Smiley, Kewanee, Illinois, aged sixty, died in his office, September 15th, from cerebral hemorrhage.

Thomas J. McCoy, Los Angeles, Professor of Ophthalmology in the College of Physicians and Surgeons in the University of Southern California; eye and ear surgeon to a number of railways; well known as a specialist on the eye, ear, nose and throat; died at his home, October first, from angina pectoris.

PERSONAL.

Dr. W. A. Adams of Denver has taken offices in the Commonwealth Building.

Dr. Robert Randolph of Baltimore is still absent from his office on account of poor health.

Dr. Leon Block, Denver, announces the opening of offices in the Central Savings Bank Building.

N. Bishop Harman has been appointed Ophthalmic Surgeon to the National Institute for the Blind in England.

Dr. John W. Burke, Washington, D. C., has resumed practice at 1610 I street, N. W. He is no longer associated with Drs. Wilmer and Morrison.

Dr. H. O. Reik has been appointed secretary of the new postgraduate movement in New York City, and has left Baltimore to take up his residence in that city.

Dr. E. D. Everett, Capt. M. C., U. S. A., ophthalmologist to the General Hospital, No. 21, Carlisle, Pa., has returned from France, and is now located at Frostwood, Md.

Dr. J. E. Vallee, ex-house surgeon at the New York Post Graduate School and Hospital, announces his removal to Los Angeles, with offices in the Title Insurance Building.

The oculists of Baltimore are very glad to welcome Dr. Harry Friedenwald, lately returned from the Orient. Dr. Friedenwald has been elected vice-president of the Zionists of America.

Dr. Casey A. Wood will spend the next three months in Washington, D. C., completing his work on the Medical and Surgical History of the War. He stopped in Chicago two days on his way east from California.

Dr. Andrew Carr of Minot, N. D., returned from France, is now in charge of the Eye Department of the Illinois Eye and Ear Infirmary. Dr. Carr is also assistant to Dr. Brown in the Eye Clinic of the Medical Department of the University of Illinois.

Dr. R. A. Fenton of Portland, Ore., has resumed practice after 18 months service overseas with Base Hospital, No. 46. After the armistice he became consultant in Ophthalmology to the Army of Occupation in Germany, heading the eye work in the hospitals in Luxemburg.

At the annual tournament of the Chicago Physicians' Golf Association, September 30th to October 1st, the championship medal was won, for the fourth time, by Dr. Frank Brawley. Dr. Brawley was further honored by being made president of the association.

MILITARY NOTES.

Dr. William G. Bowerman has opened offices in Yonkers, N. Y., since retiring from service.

Dr. E. S. Adams, formerly of Pueblo, Colorado, has returned from military service, and opened offices in Trinidad.

Dr. Percival Dolman has returned to San Francisco, after fifteen months' service in the Medical Department of the U. S. army.

Major A. E. J. Lister, ophthalmic surgeon to King George's Medical College, has been appointed an honorary surgeon to His Excellency the Viceroy and Governor-General of India.

Dr. John M. Wheeler, who has been in charge of the eye service at Base Hospital, No. 2, Ft. McHenry, Md., was discharged, September 15th, and has resumed his practice at 80 West Fortieth street, New York. The Department in Ophthalmology at Fort McHenry had a large service in plastic surgery about the eyes.

The following ophthalmologists have been reported as returned from Government service: To New York City—Drs. E. G. Morton, F. Dunnington, Henry R. Skeel, J. F. Van Fleet, W. F. Steinbugler, D. T. MacPhail, L. W. Callan, C. A. McConville, S. T. Hubbard, Conrad Berens, Jr., J. S. Smith, J. F. Bowman, A. B. Bruner, L. E. Hetrick, G. F. Patton, E. B. Thompson, D. H. Webster, W. F. Macklin, F. W. Shine, Bernard Samuels, Catesby Jones, G. F. Gracy, Webb W. Weeks, D. P. Platt and G. H. Grout. To Brooklyn, N. Y.—Drs. J. E. Golding, C. A. Harget, James A. Bilello and E. C. Place.

SOCIETIES.

The first meeting of the season of the Chicago Ophthalmological Society was held on the evening of October 13th, when an unusually large number of interesting clinical cases were presented for examination.

An Ophthalmological Society has been formed in Bucharest, with Professor Constantinesco as president and Dr. Ghica as secretary. The society meets twice a month at the Coltzan Hospital and publishes its transactions twice a year.

The Section on Ophthalmology of the New York Academy of Medicine presented the following program on the evening of October 20th:

1. Presentation of patients.
   Extraction of cataract in a case of megalocornea, by Dr. Carl Koller.
2. Subject of the evening—"Postgraduate Teaching in Ophthalmology."
   a. Experiences based on the recent military course of instruction in ophthalmology. Dr. Meyer Wiener, St. Louis.
   b. Suggestions regarding the teaching of ophthalmology. Dr. F. H. Verhoeff, Boston.
   c. Discussion by Dr. Edward Jackson, Denver; Dr. G. E. de Schweinitz, Philadelphia; Dr. W. H. Wilder, Chicago; Dr. W. R. Parker, Detroit; Dr. J. E. Weeks, New York; Dr. Alexander Duane, New York; Dr. W. A. Holden, New York, and others.

The meeting was presided over by Dr. Arnold Knapp.

OPHTHALMIC LITERATURE

These lists contain the titles of all papers bearing on Ophthalmology received within the preceeding month. These titles are all in English, some of them modified to indicate more clearly their subjects. These subjects are grouped under appropriate heads, the succession of groups being the same from month to month. In the group the papers are arranged alphabetically usually by the name of the author in heavy-face type. After the subject of the paper (Ill.) indicates the number of illustrations. (Pl.) the number of plates, and (Col. pl.) colored plates illustrating the article. (Abst.) shows that it is an abstract of the original article. (Bibl.) tells that the paper is accompanied by an important bibliography. (Dis.) means that a discussion of the subject is published with it. Under Repeated Titles are indicated additional publication of papers already noticed. To secure the earliest possible notice writers may send copies of their papers, or reprints, to 518 Majestic Bldg., Denver, Colorado.

DIAGNOSIS.

Azmy, Y. Simulated Eye Diseases in Egypt. (Dis.) Bull. Ophth. Soc. Egypt, 1919, pp. 129-136.

Butterworth, A. K. Eyesight Tests for Railwaymen. Brit. Jour. Ophth., v. 3, pp. 460-461.

Cohen, M. Apparatus for Securing a Red-free Light for Fundus Examination. Arch. of Ophth., v. 48, p. 527.

Howard, H. J. Judgment of Distance with Semaphore and a Screen at 100 Meters. (3 ill.) Arch. of Ophth., v. 48, pp. 461-474.

Koller, C. An Improved System of Illumination for the Electric Ophthalmoscope. Amer. Jour. Ophth., v. 2, p. 703.

Korff-Petersen. Strength of Light Rays, Visual Acuity and Reading. Münch. med. Woch., 1919, 24. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, p. 159.

THERAPEUTICS.

Duran, B. C. Parenteral Injections of Milk with Eye Disease. Med. Ibera, v. 7, p. 183. Abst., Jour. Amer. Med. Assn., v. 73, p. 1020.

Jacovides. Autoserum in Ocular Therapeutics. Bull. Ophth. Soc. Egypt, 1919, pp. 80-85.

Johnson, J. A. Experiments on Rabbits with Salvarsan, Therapeutic and Toxic Doses. Amer. Jour. Ophth., v. 1, pp. 741-743.

Kerry, R. Iodin in Inflammation of the Eye. Brit. Jour. Ophth., v. 3, pp. 448-452.

Lundsgaard, K. K. K. Treatment of Eye Diseases by Parenteral Injections of Milk. Ugeskr. f. Laeger., 1919, 81, pp. 423-426.

Zbikowski, E. Quinin in Ocular Therapeutics. España Oft., July, 1919, p. 239.

Repeated Titles. **Gros and Fromaget.** (v. 2, p. 305) Brit. Jour. Ophth., v. 3, p. 473.

REFRACTION.

Clegg, J. G. Notation of Axes of Cylinders. (5 ill.) Brit. Jour. Ophth., v. 3, pp. 443-448.

Dameno, E. Refraction Findings in Malingerers. Prenza Med., Argentina, v. 5, p. 354.

Des Voeux, H. A. The Symptoms of Eye Strain as Met with in General Practice. Tr. Med. Soc., Lond., 1917-18, 41, pp. 204-219.

Eager, R. Early Treatment of Mental Disorders; Correction of Refractive Errors. Lancet, Sept. 27, p. 562.

Jackson, E. Etiology of Myopia. Amer. Jour. Ophth., v. 2, p. 700.

Lafon, C. Pithiatique Spasm of Convergence and Accommodation. Ann. d'Ocul., v. 156, pp. 449-475.

Stöhr, A. Physiologic Optics. (78 ill.) F. Deuticke, Leipzig.

Tscherning, M. Fitting of Glasses and Optical System. (3 ill.) Ann. d'Ocul., v. 156, pp. 498-506.

Wells, D. W. Round Spectacle Lenses. (1 ill.) Section on Ophth., A. M. A., 1919, pp. 386-388.

OCULAR MOVEMENTS.

Bard, L. Nystagmus from Rotation. Revue Neurolog., v. 26, p. 177.
Artificial Nystagmus of Rotatory and Vertical Types. Ann. de Méd., v. 6, p. 165.

Broome, F. C. S. Heterophoria. Jour. Roy. Nav. Med. Serv., Lond., 1919, pp. 175-179.

Castresana, B. New Operation for Strabismus. (95 p. ill.) Madrid, 1919. Abst., Jour. Amer. Med. Assn., v. 73, p. 461.

Cilleruelo. Modification of Terrien's Suture in Muscular Advancement. (1 ill.) Arch. de Oft. Hisp.-Amer., v. 19, pp. 489-492.

Dolman, P. Maddox Rod Screen Test. (Bibl.) Arch. of Ophth., v. 48, pp. 503-515.

de Kleijn. Reflex Action of Labyrinth and Neck on Eye Muscles. Arch. Neerl. de Physiol., 1918, 2, p. 644. Abst., Jour. Nerv. and Ment. Dis., v. 50, p. 268.

Lindgren, E. Amblyopia Ex Anopsia Cured after Six Years. Ugeskr. f. Laeger. Kobenh., 1919, v. 81, p. 366.

Report of Committee on Collective Investigation Concerning the Ocular Muscles. Section on Ophth., A. M. A., 1919, pp. 390-393.

Wright, E. W. One Eye a Necessity, Two a Luxury. Med. Council, v. 24, p. 749.

CONJUNCTIVA.

Archibald. Epithelial Xerosis of the Conjunctiva. Med. Jour. of Australia, Aug. 30, 1919, p. 177.

Bayer, W. G., and Herrenschwand, F. v. Pseudotubercle bacilli in Production of Conjunctivitis. Graefe's Arch. f. Ophth., v. 98, 3 and 4, 1919. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, pp. 155-156.

Chance, B. Trachoma in the Camps and Hospitals of the Army. Amer. Jour. Ophth., v. 2, pp. 693-694.

Diamere, V. Differential Virulence of Gonococcic and Purulent Ophthalmia. Arch. di Ottal., 26, pp. 45-48.

Eason, H. L. Ophthalmia in Egypt among Napoleon's Troops, 1799-1801; among British Troops, 1916-18. Bull. Ophth. Soc. Egypt, 1919, pp. 13-31.

Galindez, Rivero, J. Treatment of Trachoma. España Oft., July, 1919, p. 230.

Gamal ed Dine. Pseudomembranous Conjunctivitis. (Dis.) Bull. Ophth. Soc. Egypt, 1919, pp. 98-104.

Girgis, A. M. Prevalence of Spring Catarrh in Egypt. (Dis.) Bull. Ophth. Soc. Egypt, 1919, pp. 121-129.

Guglianetti, L. Action of the Meningococcus on the Eye. Riforma Med., v. 35, p. 662. Abst., Jour. Amer. Med. Assn., v. 73, p. 1167.

MacCallan, A. F. Causes of Nontrachomatous Ophthalmia in Egypt. Bull. Ophth. Soc. Egypt, 1919, pp. 32-43.
Causes of Blindness in Egypt. Bull. Ophth. Soc. Egypt, 1919, p. 137. Amer. Jour. Ophth., v. 2, p. 735.

Mouton. War on Trachoma in Amsterdam. Zeit. f. Schulgesundheitspfl., 1919, No. 2. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, p. 159.

Pereyra, G. Streptotrichosis of Conjunctiva. (2 pl., Bibl.), Arch. di Ottal., 26, pp. 1-20.

Sanson, A. D. de. Prophylaxis of Trachoma. Arch. de Med., Brazil., v. 9, p. 234.

Sauvineau, C. Antigonococci Vaccine and Blennorrhea. Clin. Opht., 22, pp. 458-460.

Sommer, A. Gonorrheic Conjunctivitis. Intravenous Injections of Arthigon. Dermatolog. Woch., 1919, No. 21. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, p. 153.

Thompson, M. M. Ophthalmia Neonatorum Cured by Radiant Light. Amer. Jour. Electrotherap. and Radiology, July, 1919, p. 209.

Weeks, J. E. Argyrosis of Conjunctiva and Cornea. Arch. of Ophth., v. 48, p. 527.

Wing, P. B. Trachoma on the Pacific Coast. Amer. Jour. Ophth., v. 2, pp. 702-703.

Zentmayer, W. Use of Ethylhydrocuprein. Amer. Jour. Ophth., v. 2, p. 695.

CORNEA AND SCLERA.

Aziz el Anuizy, A. Treatment of Infected Ulcer of Cornea with Subconjunctival Injections of Mercury Perchlorid. (Dis.) Bull. Ophth. Soc. Egypt, 1919, pp. 85-98.

Bentzen, C. F. Optochin Therapy of Serpiginous Corneal Ulcer. Ugeskr. f. Laeger. Kobenh., 1919, 81, pp. 418-423.

Dabney, S. G. Blue Cornea. Kentucky Med. Jour., v. 17, p. 396.

Dubois, H. F. Therapy of Hypopion Ulcer with Optochin. Nederl. Tijdschr. v. Geneesk., 1919, 1, pp. 1219-1225.

Fischel, A. Influence of the Eye on Development and Composition of Cornea. Klin. M. f. Augenh., 1919, 62, pp. 1-5.

Fox, L. W. New Operation for Conical Cornea. (5 ill.) Amer. Jour. Ophth., v. 2, pp. 738-740.

Hegner, A. Severe Necrosis of the Cornea in a Case of Salvarsan Poisoning. Klin. M. f. Augenh., Nov.-Dec., 1917. Abst. Brit. Jour. Ophth., v. 3, p. 470.

Hoeg, N. Tuberculous Parenchymatous Keratitis Treated with Tuberculin. Ugeskr. f. Laeger, Kobenh., 1919, 81, pp. 412-417.

Langdon, H. M. Hypopyon Ulcer of Cornea Treated by Chauffage. Amer. Jour. Ophth., v. 2, p. 698.

Lindgren, E. Treatment of Proliferating Maculae Corneae by Conjunctival Transplants. Ugeskr. f. Laeger, 1919, 81, pp. 412-417.

McDannald, C. E. Twin with Interstitial Keratitis. (Dis.) Arch. of Ophth., v. 48, p. 523.

Menacho, M. Transparent Scleral Cyst. (4 ill.) Arch. de Oft. Hisp.-Amer., v. 19, pp. 486-488.

Nance, W. O. Treatment of Serpiginous Ulcer of Cornea. Illinois Med. Jour., v. 26, pp. 182-184.

Szymanowski, K. Pathology of Scleritis. Klin. M. f. Augenh., v. 62, pp. 21-30.

Stähli, I. Microcornea. Klin. M. f. Augenh., March-Apr., 1919. Abst., Woch. f. Therap u. Hyg. d. Auges, v. 22, pp. 154-155.

Verhoeff, F. H. Keratitis Profunda (or Disciformis?) with Microscopic Examination. (1 pl.) Arch. of Ophth., v. 48, pp. 449-460.

Weeks, J. E. Maculoanesthetic Leprosy of Brow and Cornea. Arch. of Ophth., v. 48, p. 527.

Zentmayer. Congenital Pigmentation of the Sclerotics. Amer. Jour. Ophth., v. 2, p. 694.

Repeated Titles. **Kraupa.** (v. 2, p. 467) Ann. d'Ocul., v. 156, p. 234. **Rönne.** (v. 2, p. 468) Brit. Jour. Ophth., v. 3, p. 469.

ANTERIOR CHAMBER AND PUPIL.

Blake, E. M. Cilium in the Anterior Chamber. Arch. of Ophth., v. 48, p. 526.

Cabannes. Pupil Accommodation and Convergence Reflexes. Jour. de Méd. de Bordeaux, v. 90, p. 314. Abst. Jour. Amer. Med. Assn., v. 73, p. 1093.

Demaria, E. B. Experimental Hydatidosis in Dog. (15 ill.) Arch. de Oft. Hisp.-Amer., v. 19, pp. 461-487.

Guglianetti, L. Viscosity of the Aqueous Humor. Arch. di Ottal., v. 26, p. 53.

UVEAL TRACT.

Davis, A. E. Tuberculosis of the Choroid. Arch. of Ophth., v. 48, p. 525. Uveitis. (Dis.) Section on Ophth., A. M. A., 1919, pp. 305-315.

Leoz Ortin. Tuberculous Iritis with Gummatous Keratitis. Med. Ibera, v. 7, p. 204.

Samperi, G. Pneumococcic Metastatic Oph-

thalmia in Influenza. (2 ill. Bibl.) Arch. di Ottal., 26, pp. 19-44.

Zentmayer. Uveitis with Disciform Opacities. (Dis.) Amer. Jour. Ophth., v. 2, pp. 694-695.

Repeated Titles. **Urra.** (v. 2, p. 550) Jour. A. M. A., v. 73, p. 1096.

SYMPATHETIC DISEASE

Böhm, K. Sympathetic Ophthalmia in Spite of Preventive Enucleation. Klin. M. f. Augenh., 1919, Feb. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, p. 156.

Peters, A. So-called Sympathetic Irritation. Münch. med. Wochenschr., 1918, 65, pp. 1370-1373.

Sobhy. Sympathetic Ophthalmia Diagnosed Microscopically. (Dis.) Bull. Ophth. Soc. Egypt, 1919, pp. 43-50.

Repeated Titles. **Dor** (v. 2, p. 307), Brit. Jour. Ophth., v. 3, p. 472. **Schevensteen** (v. 1, p. 813), Brit. Jour. Ophth., v. 3, p. 465. **Schieck** (v. 2, p. 173), Brit. Jour. Ophth., v. 3, p. 463.

GLAUCOMA.

Abboudy, A. Incision of Ciliary Body in Hemorrhagic Fulminating Glaucoma and Diabetes. Bull. Ophth. Soc. Egypt, 1919, pp. 77-79.

Relation Between Syphilis and Glaucoma. (Dis.) Bull. Ophth. Soc. Egypt, 1919, pp. 59-64.

Dubois, H. F. Late Infection in Scleral Trepanation. Nederl. Tijdschr. v. Geneesk., 1919, 1, pp. 1234-1236.

Herbert. Future Glaucoma Operation. (Dis.) Arch. of Ophth., v. 48, p. 518.

Knapp, A. Spontaneous Reduction of Tension in Glaucoma. Arch. of Ophth., v. 48, pp. 525-526.

Muttayya, V. G. Glaucoma. Antiseptic. Edinb. and Madras, 1919, 16, pp. 47-57.

Peter, L. C. Buphthalmos: Results of Posterior Sclerectomy and Optical Iridectomy. Amer. Jour. Ophth., v. 2, pp. 695-696.

Smith, P. Tonometric Values. Brit. Jour. Ophth., v. 3, pp. 476-480.

Sobhy, M. Elliot's Trephining in Chronic Glaucoma. (3 ill. Dis.) Bull. Ophth. Soc. Egypt, 1919, pp. 63-76.

Weeks, J. E. Personal Observations Regarding the Treatment of Glaucoma. (Dis.) Section on Ophth. A. M. A., 1919, pp. 371-385.

Young, G. Results of Double Sclerectomy Operation for Glaucoma. Arch. of Ophth., v. 48, p. 518.

Zaki Seddik. Late Infection after Trephining. (Dis.) Bull. Ophth. Soc. Egypt, 1919, pp. 50-58.

CRYSTALLINE LENS.

Clark, C. F. Coloboma and So-Called Congenital Dislocation of the Lens. (1 ill.) Arch. of Ophth., v. 48, pp. 475-484.

Cohen, M., and Levin, I. Action of Radium on Cataract. (Dis. 1 pl. with 24 ill.) Jour. A. M. A., v. 73, pp. 1193-1200. Section on Ophth., A. M. A., 1919, pp. 202-221.

Darier, A. Surgical Treatment of Cataract. Clin. Opht., v. 22, pp. 439-458.

Gonzalez, J. de J. Spontaneous Rupture of Morgagnian Cataract. Amer. Jour. Ophth., v. 1, p. 743.

Olivares. Suture of Cornea in Cataract Extraction. España Oft., July, 1919, p. 217.

Scheer, W. M. van der. Cataractous Lens in Mongolian Idiocy. Klin. M. f. Augenh., 1919, Feb. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, p. 153.

Schweinitz, G. E. de, and Wiener, M. Anterior Lenticonus (1 ill. Dis.) Jour. Amer. Med. Assn., v. 73, pp. 1191-1192. Section on Ophth., A. M. A., 1919, pp. 325-330.

Weeks, J. E. Cholesterin Crystals in Hypermature Cataract. Arch. of Ophth., v. 48, p. 527.

RETINA.

Angelucci, A. Sight for the Blind. Arch. di Ottal., v. 26, pp. 49-52.

Blue, R. Family Degeneration of the Macula Lutea. (Dis.) Section on Ophth. A. M. A., 1919, pp. 191-201.

Buck, R. H. Recurring Spontaneous Retinal Hemorrhage of Tuberculous Origin. Amer. Jour. Ophth., v. 2, pp. 731-735.

Cobb, P. W. Dark Adaptation. (5 ill.) Arch. of Ophth., v. 48, pp. 492-502.

Collins, T. Abiotrophy of the Retinal Neuroepithelium, or Retinitis Pigmentosa. (Dis.) Arch. of Ophth., v. 48, pp. 517-518.

Eason, H. L. Congenital Cone Blindness. Bull. Ophth. Soc. Egypt, 1919, pp. 105-108.

Elschnig, A. Tumor-like Thickening in Macula Lutea. Klin. M. f. Augenh., 1919, Feb. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, p. 154.

Jackson, E, and Finnoff, W. C. Tuberculosis of Retina. (1 Fig., 2 pl.) Amer. Jour. Ophth., v. 2, pp. 715-722.

Lodge, O. Nature of Retinal Function. Jour. Amer. Med. Assn., v. 73, p. 1299.

Marin Amat. Marcus Gunn Syndrome. España Oft., July, 1919, p. 231.

Peter, L. C. Unusual Case of Perivasculitis. Amer. Jour. Ophth., v. 2, pp. 696-697.

Roelofs, C. O., and Zeeman, P. C. Vision in Semidarkness and Nightblindness. Nederl. Tijdschr. v. Geneesk, v. 1919, p. 2101.

Schweinitz, G. E. de, and Wiener, M. Congenital Multilocular Cysts in Relation with the Retina. (1 ill.) Dis. Jour. Amer. Med. Assn., v. 73, pp. 1189-1190. Section on Ophth., A. M. A., 1919, pp. 322-325.

Repeated Titles. **Darier** (v. 2, p. 308), Brit. Jour. Ophth., v. 3, p. 471.

TOXIC AMBLYOPIAS.

Addario La Ferla, G. Ocular Symptoms in Saturnism. (Bibl.) Arch. di Ottal., v. 26, pp. 76-92.

Haas, H. K. de. Arsenic as Cause of Diseases of Retina and Optic Nerve. Graefe's Arch. f. Augenh., v. 99, part 1, 1919. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, p. 158.

Jamieson, T. H., and Lindsay, W. I. Effects of Long Continued Dosage with Quinin. Jour. Roy. Army Med. Corps, Lond., 1919, 32, pp. 295-306.

OPTIC NERVE.

Bollack, J. Papillary Stasis in Cerebral Tumor. Clin. Opht., 22, pp. 460-465.

Existence of Specialized Papillary Vessels in Optic Nerve. Klin. M. f. Augenh., 1919, Feb. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, p. 156.

Fleming, L. B. Can Simple Concussion of the Brain Give Rise to Optic Neuritis? Brit. Jour. Ophth., v. 3, p. 453.

Imamura, S., and Ichikawa, K. Familial Atrophy of the Optic Nerve with Tremor and Mental Impairment. Rev. Neur., 26, p. 277. Abst., Jour. Amer. Med. Assn., v. 73, p. 1166.

Langdon, H. M. Sudden Loss of Vision from Acute Sphenoiditis: Recovery. Amer. Jour. Ophth., v. 2, pp. 697-698.

Rönne, H. A Typical Case of Retrobulbar Neuritis. Klin. M. f. Augenh., v. 62, pp. 51-59.

White, L. E. Loss of Sight from Retrobulbar Neuritis due to Posterior Sinus Disease. Boston Med. and Surg. Jour., v. 181, pp. 483-490.

VISUAL TRACTS AND CENTERS.

Charlin, C. Bilateral Hysteric Amblyopia after Trauma of Face. Rev. Med. de Chile, v. 47, p. 365.

Coutela. Visual Troubles in Head Injury. Ann. d'Hyg., v. 29, p. 55.

Dameno, E. Blindness with Diabetes Insipidus in a Boy of Ten. Prenza Med., Argentina, v. 5, p. 345. Abst., Jour. Amer. Med. Assn., v. 73, p. 1020.

Perthes. Removal of Tumor of Choroid Plexus. Münch. med. Woch., 1919, 25. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, pp. 157-158.

Santos Fernandez, J. Homonymous Hemianopsia and Trauma of the Occipital Region. Arch. de Oft. Hisp.-Amer., v. 19, p. 492.

Schweinitz, G. E. de. Ocular Phenomena in the Psychoneuroses of Warfare. (7 ill.) Arch. of Ophth., v. 48, pp. 419-438.

Sym, W. G. Visual Orientation and its Disturbance. Edinb. Med. Jour., v. 23, p. 145.

Throckmorton, T. B. A Case of Tumor of the Pons Varolii. Jour. Amer. Med. Assn., v. 73, pp. 1279-1280.

Wilson, J. A. Gunshot Injuries of the Cortical Visual Areas. (5 ill.) Brit. Jour. Ophth., v. 3, pp. 453-459.

COLOR VISION.

Gjessing, H. Color Perception and Color Blindness. Tidsskr. f. d. norske Laegefor., 1918, 38 pp. 857-874.

Holth, S. Holmgren's Worsted Skeins or Stilling's Plates in Testing for Color Perception. Tidsskr. f. d. norske Laegefor., 1918, 38, pp. 553-560.

Schiötz, I. Studies and Tests of Color Perception. Tijdschr. f. d. norske Laegefor., 1919, 39, p. 41.

EYEBALL.

Grimsdale, H. Early Case of Mules' Operation. Brit. Jour. Ophth., v. 3, p. 452.

Ochi, S. Experimental Study of Histogenesis of Eye Abnormalities in the Chick Embryo. (4 ill. Bibl.) Brit. Jour. Ophth., v. 3, pp. 433-443.

Sondermann, R. Modified Exenteration and Enucleation. Klin. M. f. Augenh., v. 62, pp. 78-83.

THE LACRIMAL APPARATUS.

Atkinson, D. T. Abnormalities of the Lacrimal Apparatus. Western Med. Times, v. 39, pp. 129-130.

Fernandez, F. M. Gonococcus Dacryocystitis. Cron. Med.-Quirurg., v. 45, p. 135.

Galindez Rivero, J. Treatment of Dacryocystitis. España Oft., July, 1919, p. 229.

Green, J. Jr. Treatment of Dacryocystitis by Curettage. (4 ill., Bibl.) Amer. Jour. Ophth., v. 2, pp. 723-730.

Heermann, J. Suppuration of Tear Sac from Wound of the Antrum of Highmore. Cured by West's Operation. Klin. M. f. Augenh., v. 62, pp. 88-90.

Löhlein, W. Hereditary Dislocation of the Orbital Tear Gland. Münch. med. Woch., 1919, 24. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, p. 157.

LIDS.

Bell, G. H. Cutaneous Horn. Arch. of Ophth., v. 48, p. 523.

Angioneurotic Edema of Lids. Arch. of Ophth., v. 48, p. 523.

Dabney, S. G. Deformity of Lower Eyelids. Kentucky Med. Jour., 17, p. 396.

Davis, A. E. Double Congenital Ptosis. Arch. of Ophth., v. 48, p. 525.

Ekdawi, A. Y. Modification of Panas' Operation. (Dis.) Bull. Ophth. Soc. Egypt, 1919, pp. 109-113.

Esser, I. F. S. Inversion of Lids with Abnormal Growth of Lashes. Klin. M. f. Augenh., 1919, Feb. Abst., Woch. f. Therap. u. Hyg. d. Auges, v. 22, p. 154.

Hessberg, R. Operative Correction of Ectropion of Lower Lid at Inner Canthus. Klin. M. f. Augenh., v. 62, pp. 84-88.

Mahfouz, M. Grafting Peritoneum of Frog for Trichiasis. (Dis.) Bull. Ophth. Soc. Egypt, 1919, pp. 113-120.

Marquez. Congenital Coloboma of Upper Lid. Arch. de Oft. Hisp.-Amer., 19, p. 494.

Mendicini, A. Tonic Unilateral Spasm of Eyelids. Policlinico, v. 26, p. 286.

Zentmayer, W. Congenital Ptosis. Motais Operation. Amer. Jour. Ophth., v. 2, p. 695.

Bilateral Congenital Entropion. Amer. Jour. Ophth., v. 2, p. 694.

ORBIT.

Dabney, S. G. Venous Thrombosis or Orbital Cellulitis. Kentucky Med. Jour., v. 17, p. 389.

Lemaitre, F., and Brémond, M. Mucocele of Ethmoid. (5 ill.) Ann. d'Ocul., v. 156, p. 475.

Lindgren, E. Fat Transplantation into Tenon's Capsule after Enucleation. Ugeskr. f. Laeger. Kobenh., 1919, 81, pp. 363-366.

Magee, R. S. Traumatic Pulsating Exophthalmos. Amer. Jour. Ophth., v. 2, p. 744.

Montoya y Florez, J. B. Exophthalmic Goiter in Colombia. Rev. Clin., Med., v. 2, p. 1. Abst., Jour. Amer. Med. Assn., v. 73, p. 1251.

Tyson, H. H. Spontaneous Pulsating Exophthalmus. Arch. of Ophth., v. 48, pp. 523-525.

Van Iterson, C. Mucocele of Ethmoid. Nederl. Tijdschr. v. Geneesk, 1918, v. 1, p. 83.

PARASITES.

Holth, S. Filaria Loa in Orbit. Norsk Magazin Laegevidensk., v. 80, p. 939.

Schweinitz, G. E. de, and Wiener, M. Cysticercus in the Vitreous. (1 ill. Dis.) Jour. Amer. Med. Assn., v. 73, pp. 1187-1189. Section on Ophth., A. M. A., 1919, pp. 316-322.

TUMORS.

Hough, P. B. Orbital Tumor. Arch. of Ophth., v. 48, p. 526.

Lloyd, R. I. Phantom Intraocular Tumor, Multilocular Cyst of Iris and Ciliary Body. (1 ill.) Arch. of Ophth., v. 48, pp. 489-491.

Marongiu, L. Melanocarcinoma of Lower Lid. (8 ill. Bibl.) Arch. di Ottal., v. 26, pp. 67-75.

Schoenberg, M. J. Bilateral Glioma of Retina Apparently Arrested in the Non-Enucleated Eye by Radium Treatment. (Dis.) Arch. of Ophth., v. 48, pp. 485-488, and 522.

Uhthoff, W Radiotherapy of Bilateral Glioma with Anatomic Examination. Klin. M. f. Augenh., v. 62, pp. 6-20.

INJURIES.

Buckley, J. H. Foreign Body in Eye Nearly 29 Years. Amer. Jour. Ophth., v. 2, p. 746.

Derby, G. S. Ocular Manifestations Following Exposure to Poison Gas. (Dis.) Amer. Jour. Ophth., v. 2, pp. 685-687.

Greenwood, A. Primary Treatment of War Injuries to Orbit. (Dis.) Amer. Jour. Ophth., v. 2, pp. 687-689.

Kingston, G. A. Eye Injuries. Proc. Internat. Assn. Indus. Accid. Bds., 1917, Wash., 1919, 4, 269-281.

Perol, P. and Bazin, G. Localization of Foreign Bodies in the Eye. Jour. d. Radiol., v. 3, pp. 303, and 310.

PATHOLOGY.

Suganuma, S. Microscopic Findings in Neurorecidive in Eye after Injection of Arsaphenamin. Japan Med. World, Aug. 31, 1919.

GENERAL DISEASES.

Bell, G. H. Relation of Teeth, Tonsils, and Intestinal Toxemias to Diseases of the Eye. (Dis.) Section on Ophth., A. M. A., 1919, pp. 266-293.

Binet, L. The Oculo-Cardiac Reflex. Presse Méd., v. 27, p. 462. Abst., Jour. Amer. Med. Assn., v. 73, p. 1094.

Gonzalez, J. de. J. Ocular Complications of Mexican Typhus. Anales de Soc. Oftal. Mex., August, 1919, pp. 173-195.

Levi-Sander, E. Sanitarium for Tuberculosis of the Eye. Klin. M. f. Augenh., 1919, 62, p. 120.

Patton, J. M. Ocular Manifestations of Lethargic Encephalitis. Nebraska State Med. Soc. Jour., v. 4, pp. 265-269.

Roorda Smit, J. H. Negative Wassermann Reaction with Ocular and Cerebral Syphilis. Nederl. Tijdschr. v. Geneesk., 1919, v. 1, p. 2256. Abst., Jour. Amer. Med. Assn., v. 73, p. 1172.

Schweinitz, G. E. de. Ocular Phenomena in the Psychoneuroses of Warfare. (Dis.) Amer. Jour. Ophth., v. 2, pp. 691-693.

Sinclair, W. Eye Complications in Cerebrospinal Meningitis. Arch. of Oph., v. 48, p. 519.

Terson, A. Ocular Localizations and Complications of Polymorphous Erythema. Paris. Méd., v. 9, p. 178. Abst., Jour. Amer. Med. Assn., v. 73, p. 1247.

HYGIENE.

Balfour, A. Problems of Hygiene in Egypt: Ophthalmic Hospitals. Lancet, Sept. 13, 1919, pp. 468-9.

Guijarro. Ocular Hygiene. España Oft., July, 1919, p. 230.

OPHTHALMIC SOCIOLOGY.

Cantor, S. J. The Education and Care of the Blind. Med. Jour. of Australia, Sept. 6, 1919, pp. 191-195.

Parker, W. R. Observations of an Administrative Officer. (Dis.) Amer. Jour. Ophth., v. 2, p. 685.

Parsons, J. H. Eyesight Tests for Railwaymen. Brit. Jour. Ophth., v. 3, p. 460.

Report of the Committee on Prevention of Hereditary Blindness. Section on Ophth., A. M. A., 1919, p. 389.

Titles of Communications. Brit. Jour. Ophth., v. 3, p. 461.

Wilder, W. H. Requirements of Ocular Examinations for the Army. (Dis.) Amer. Jour. Ophth., v. 2, p. 684.

Wilmer, W. H. Ocular Functions of Aviators. Arch. of Ophth., v. 48, pp. 439-448, and p. 519.

Report of the Committee on Knapp Testimonial Fund. Section on Ophth., A. M. A., 1919, p. 394.

EDUCATION, HISTORY AND BIOGRAPHY.

Danis, M. Belgian Society of Ophthalmology. Amer. Jour. Ophth., v. 2, pp. 699-700.

Jackson, E. To Avoid Professional Ruts. Amer. Jour. Ophth., v. 2, p. 701-702.

Ophthalmologists and the Royal Colleges. Brit. Jour. Ophth., v. 3, pp. 459-460.

Report of the American Board of Ophthalmic Examinations. Section on Ophth., A. M. A., 1919, pp. 395-396.

Terrien, F. Ophthalmology in 1919. Paris Méd., v. 9, p. 173.